Quinte CONSERVATION

QUINTE CONSERVATION FOREST MANAGEMENT PLAN 2025

Quinte Conservation Forest
Forest Management Plan
2026-2045

APPROVED BY:

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(Forest Owner)

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FOREST MANAGEMENT PLAN
2026-2045

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Lanark County and the United Counties of Stormont, Dundas and Glengarry shared copies of their Forest Management Plans as reference documents.

Map and stand inventory information are current to June 30, 2025.

QUINTE CONSERVATION FOREST
FOREST MANAGEMENT PLAN

Commonly Used Forestry Terms and Acronyms

Eastern Ontario Model Forest	EOMF
Environmental Management System	EMS
Forest Resource Inventory	FRI
Forest Stewardship Council	FSC
Geographic Information System	GIS
Ontario Ministry of Natural Resources	OMNR
Ontario Professional Forester's Association	OPFA
Quinte Conservation Authority	QC
Quinte Conservation Forest	QC Forest
Registered Professional Forester	RPF
Species at Risk	SAR
Sustainable Forestry Initiative	SFI

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1.0 INTRODUCTION

Quinte Conservation (QC) represents the amalgamation of three separate authorities (the Moira River, Napanee Region, and Prince Edward Region), and is now one of 36 Conservation Authorities in Ontario. Being a community based environmental protection agency, Quinte Conservation provides cost-effective environmental expertise and leadership that develops and delivers programs to ensure the healthy coexistence between the community, its environment and its economy.

The 6,000 square kilometre area includes the drainage basins of the Moira, Napanee and Salmon Rivers and all of Prince Edward County; in addition to being home to over 117,000 people living in 18 municipalities. Quinte Conservation owns 13,105 hectares (32,161 acres) of vacant land parcels in the counties of Hastings, Lennox and Addington, Frontenac and Prince Edward. These lands contain many significant natural features.

This Twenty Year Forest Management Plan (FMP) has been prepared to describe the QC Forest landbase and history and to ensure a consistent approach to forest management in the future. The Management Plan describes the attributes of the QC Forest, the forest types and their management, and the natural and cultural heritage values and their conservation. It covers the period from January 1, 2026 to December 31, 2045. It is one part of a larger Environmental Management System as described in Section 1.7.

1.1 THE QC FOREST

The current structure of the QC Forest was greatly affected by the last 200+ years of land use history, deeply rooted in the pioneer settlement era. It has been long established that today's landscape of Eastern Ontario differs profoundly from its pre-settlement equivalent and the QC Forest is no exception. Clearing of land for farming from the late 18th century (Loyalist pioneer relocation period), followed by extensive harvest of timber to supply the British and then the growing economy of the United States greatly affected forest cover. Frequent fires and grazing also contributed to the decline. For example, forest surveys in 1948 show that forest cover was 30% in the south part of the Moira watershed and 29% in the Napanee watershed. (Ontario Government, 1950 and 1957).

Prior to this, the most dominant forest species in the area were Sugar Maple, White pine and probably Hemlock with Maple by far the most abundant in the southern parts of the watershed. Maple remains the most significant component of the forest but White Pine (the primary target of massive removal for square timber and lumber) and Hemlock (cut down, stripped of bark containing the basic ingredient for numerous tanneries and usually left to decay) to this day have not fully recovered from the treatment. White Pine is steadily regaining its prominent position, while Hemlock, more selective in site requirements, is not expected to return to its original role in the foreseeable future. It is critical to recognize the contribution of fire and grazing to the fundamental changes in the landscape over the last 200+ years. Frequent, prolonged and large fires were reported throughout the area from 1850's to 1930's; and were regularly compounded with uncontrolled grazing (causing soil compaction and contributing to erosion). These activities severely hampered the development of tree seedlings. Fires appear to have been a more prominent factor in the north part of the Forest, while overgrazing played a major role in the south. Finally, periodic flooding in the land devoid of its forest, contributed to the damage. Over several decades, all of these factors combined to deplete the fragile topsoil, obstructed natural regeneration of the forest and eventually left many areas in the state of a barren wasteland. This abuse of the land lead to the conditions where Conservation Authorities were established across southern Ontario with broad mandate to implement conservation measures.

1.2 HISTORY OF LAND ACQUISITION AND DISPOSITION

In keeping with their mandate, the three former Conservation Authorities undertook the task of preservation and restoration of forest cover, in addition to watershed protection through land acquisitions. Beginning in the 1950’s areas requiring reforestation and management were defined by the department of Planning and Development, Conservation Branch. Since that time land was gradually purchased to its current level, with most purchases having been completed prior to 1975.

The merit of individual acquisitions differed in details from case to case but a general trend can be detected. In addition to the purchase of sites in conjunction with construction of dams, properties were acquired to protect the headwaters of the watershed, prevent further deterioration of forest from grazing, stabilize eroding topsoil, protect wildlife habitat, and to demonstrate

better forestry practices. Providing the public with nature based recreational and educational opportunities was also a component of the program. Many parcels consisted of abandoned farm land with more or less depleted rocky and shallow soil, scattered patches of woody vegetation and usually severely understocked, high-graded woodlots. The circumstances and the rationale of the purchases are important to understanding the productivity and quality constraints of the forest cover.

Scattered distribution of the QC Forest properties can be regarded as a limitation or as an advantage. On one hand they do not provide the benefit of large-scale forest management offered by contiguous tracts of Crown land further north. Such large blocks allow for the management of the forest environment at the landscape level. On the other hand, the distribution of strategically located parcels managed by one agency with the primary objective of environmental protection, create an opportunity to contribute in a very significant way to the protection and enhancement of natural environment as well as the economy of the region.

The goal of the Authority's holdings are primarily to protect natural heritage and biodiversity, while providing compatible natural resource management opportunities the *long-term interest of the public*. The QC Forest will be managed primarily for control of flooding (forest cover and wetlands), protection of erodible soils, wildlife habitat, and protection of sensitive natural areas; recreational activities and production of forest products will be secondary objectives.

The history of land acquisitions is similar but unique for each for the three former CAs.

AGREEMENT FORESTS

Pursuant to The Forestry Act and The Conservation Authorities Act, CAs were able to enter into Agreements with the Ontario Department of Lands and Forests (L+F)/ Ministry of Natural Resources (OMNR) for land acquisition and management. Under the terms of these Agreements, the CAs would purchase land to be managed for forestry purposes and L+F/ OMNR would manage the lands. Forestry purposes were broadly defined as the production of wood and wood products, provision of proper environmental conditions for wildlife, protection against floods and erosion, recreation and protection and production of water supplies.

The Province of Ontario provided substantial financial support to the Agreement Forest Program. Grants were provided by the Provincial government to assist with land purchase. Records of costs and revenues incurred by the province for forest management were maintained, but not charged to the Forest Owner. Note: As a result of a fire at the Tweed District Office (in 1971) and numerous changes in record keeping & administrative practices, the management records kept by the Department of Lands and Forests are incomplete.

In 1999, a change in Provincial government priorities resulted in the end of the Agreement Forest Program. Termination Agreements were signed to dissolve the partnership, giving the CAs full responsibility for management of their Forests. In return for releasing the OMNR from its responsibilities for management of the forest, the OMNR forgave the CAs the accumulated debt incurred in management of the Forest.

Despite the termination of the agreement CAs continue to be legally bound by the conditions of the Forestry Act for lands for which the Minister made a grant for purchase. These conditions require Minister's approval for any land use change, sale or lease as well as for sharing of proceeds resulting from any land disposition, sale or lease and for the repayment of the grant in the case of a land use change. Properties that have received grants from the province are identified in Schedule "A" of the Termination Agreements.

MOIRA RIVER CONSERVATION AUTHORITY AGREEMENT FOREST

The Moira River Conservation Authority was established by Order-in-Council in 1947, and entered into its first forest management agreement with the Department of Lands and Forests in 1951. The Agreement was regularly amended to reflect subsequent land acquisitions. Conservation Areas were not part of the Agreement Forest.

NAPANEE VALLEY CONSERVATION AUTHORITY AGREEMENT FOREST

Napanee Valley Conservation Authority was also established in 1947. The Napanee Valley Conservation Authority entered into an agreement with the Department of Lands and Forests for the management of forest property in Hinchinbrooke township in 1961.

In 1973 the agreement was expanded to include additional properties in Hinchinbrooke, Kennebec, Portland and Sheffield townships following the enlargement of the Authority's land base and the change of name to the Napanee Region Conservation Authority which took place in 1965.

DEPOT LAKES CONSERVATION AREA

In keeping with its mandate, the Napanee Valley Conservation Authority concentrated on flood control by constructing a series of dams and land acquisitions. From the beginning Depot Lakes were considered the key to alleviating periodic flood and drought cycle in the Napanee Valley. The Second Depot Lake dam near the present entry to the Depot Lakes Conservation Area was constructed first, prior to 1957, followed by the system of dams on the Third and Fourth Depot Lakes, completed by 1975. Land was acquired from the County of Frontenac and from private individuals. The survey plan for parcels surrounding Third and Fourth Lake (in the north end of the Depot Lakes Conservation Area) were part of a 1968 Expropriation Plan. The acquisitions were part of a strategy to surround the Depot Lakes system with a band of conservation land maintained to withstand periodic flooding and acting as an extension of water reservoirs, at the same time providing wildlife habitat and recreational environment. Most of the Depot Lakes Conservation Area was not part of the Agreement Forest.

PRINCE EDWARD REGION (PER) CONSERVATION AUTHORITY CONSERVATION LANDS

The Prince Edward Region Conservation Authority was the last to be established, originating in 1965. All properties in Prince Edward County (PEC) are classified as Conservation Areas or Conservation Reserves. The PER lands were not an Agreement Forest.

The land acquisition program in PEC appears to have surrounded recreational values. This is exemplified by the Macaulay Mountain Conservation Area; a large block of vacant lands directly adjacent to the Town of Picton. Further, the Little Bluff Conservation Area allowed public access to a Lake Ontario cobble beach and Massassauga Point Conservation Area allows public access to the Bay of Quinte waterfront. The Beaver Meadow Conservation Area appears to have

been purchased for wildlife production, as Ducks Unlimited constructed a water control structure to enhance waterfowl habitat and recreational hunting was previously encouraged on this property.

LAND DISPOSITIONS

Since the preparation of the last major property plan for the three Authorities (namely, the Managed Forest Plans from 1998), the properties known as MF.141 Stoco Fen and MF.142 (S1/2 of Lot 21 & 22, Con 7; and NW ¼ of Lot 21, Con 6, Geographic Township of Hungerford) were transferred to Ontario Parks to assist with expanding the Stoco Fen Nature Reserve Park.

1.3 CURRENT LAND OWNERSHIP

The Quinte Conservation land holdings comprise 13,015 hectares (32,161 acres). All Quinte Forest lands are classified as Conservation Areas, Conservation Reserves or Commercial Forest properties as follows (Map 1):

Conservation Areas:	2,305 Hectares	(5,697 acres)
Conservation Reserves:	8,311 Hectares	(20,538 acres)
Commercial Forest:	2,399 Hectares	(5,926 acres)

These land use categories are described in detail in the Conservation Lands Strategy (2023). A summary of each property's attributes is provided in the Quinte Conservation Lands Backgrounder (2024). Both documents are included in Strategic Direction Section 1.5 and Appendix 1. Table 1 provides a summary of the property area by Municipality.

Map 1: Quinte Conservation Land Classifications

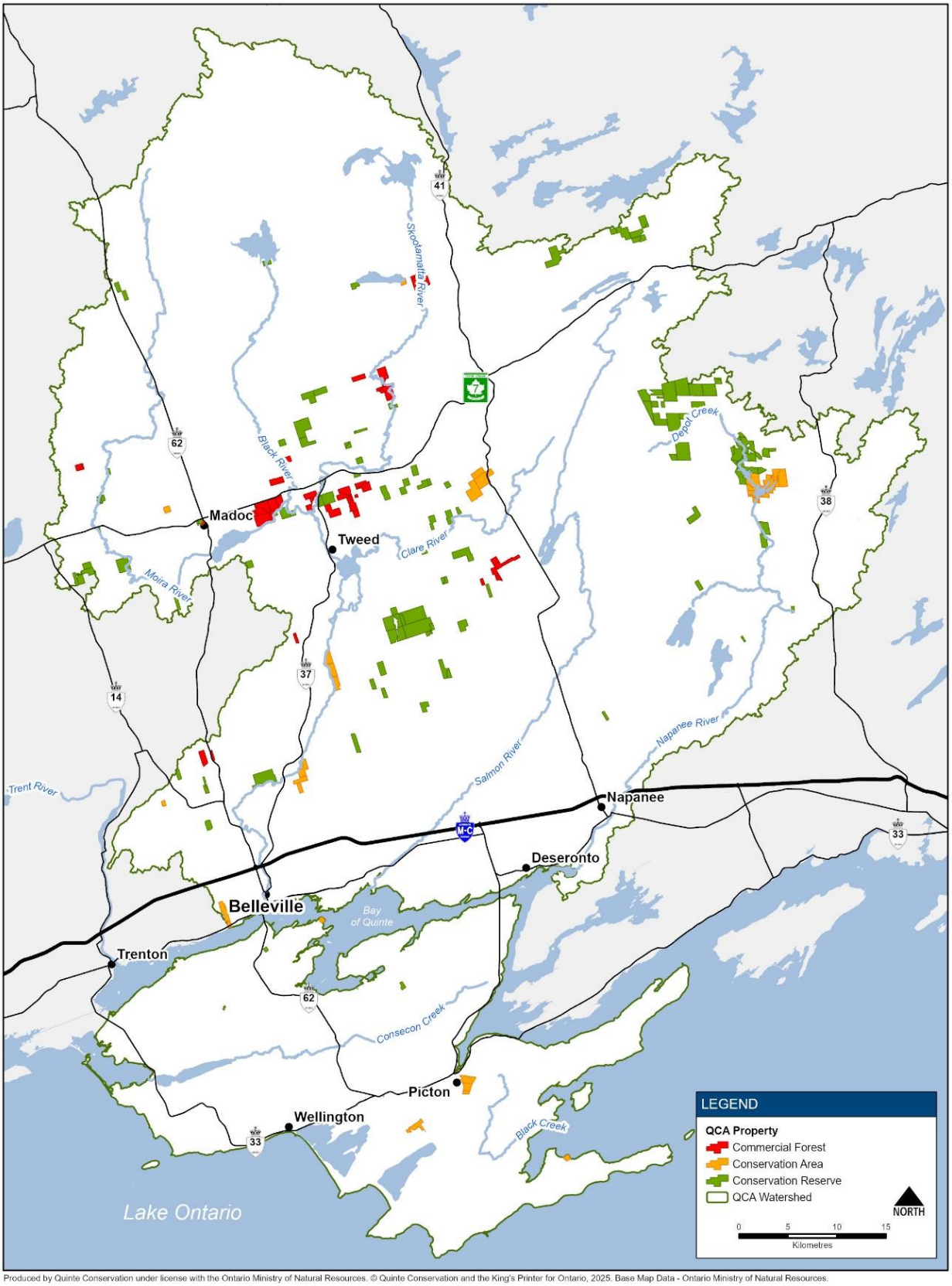


Table 1: Quinte CA Land Area by Municipality.

Municipality	Area (Hectares)	Area (acres)	Percentage
Addington Highlands			
• Kaladar	**232**	**573**	**1.8%**
Belleville			
• Thurlow	**480**	**1186**	**3.7%**
Central Frontenac			
• Hinchinbrooke	3408	8421	26.2%
• Kennebec	613	1515	4.7%
Sub-Total	**4021**	**9936**	**31.0%**
Centre Hastings			
• Huntingdon	83	206	**0.6%**
Greater Napanee			
• Fredericksburgh	8	20	0.1%
• Richmond	8	19	0.1%
Sub-Total	**16**	**39**	**0.2%**
Madoc			
• Madoc	**405**	**1000**	**3.1%**
Marmora & Lake			
• Marmora	**177**	**438**	**1.4%**
Prince Edward County			
• Ameliasburgh	31	78	0.2%
• Hallowell	267	661	2.1%
• Marysburgh	30	74	0.2%
• Sophiasburgh	28	68	0.2%
Sub-Total	**356**	**881**	**2.7%**
Quinte West			
• Sidney	**369**	**912**	**2.8%**
South Frontenac			
• Portland	**224**	**554**	**1.7%**
Stirling-Rawdon			
• Rawdon	**326**	**805**	**2.5%**
Stone Mills			
• Camden East	79	195	0.6%
• Sheffield	750	1854	5.8%
Sub-Total	**829**	**2049**	**6.4%**
Tudor & Cashel			
• Tudor	**84**	**208**	**0.6%**
Tweed			
• Elzevir	1454	3594	**11.2%**
• Grimsthorpe	40	98	**0.3%**
• Hungerford	3567	8813	**27.4%**
Sub-Total	**5051**	**12475**	**38.9%**
Tyendinaga			
• Tyendinaga	**352**	**869**	**2.7%**
Total	**13015**	**32161**	**100%**

1.3.1 PUBLIC EDUCATION PROPERTIES

Several of the Authority properties are also the focus for the development of education facilities, structures, interpretive signage, and scientific instrumentation demonstration. Property examples include the Hastings and Prince Edward District School Board Outdoor Education Facility (Frink Centre), the pioneer lifestyle demonstration at O'Hara Mill, showcasing commercial forestry activities at Vanderwater, and the promotion of astronomy at Sheffield Conservation Area. Over and above the school board, the Frink Centre conducts programming for private schools, Early Years (pre-school) and education (home school) groups. Additionally, the climate change monitoring station at the Price Conservation Area property, former Scouts camp at Vanderwater Conservation Area, and the (historic) children's day camps at Potter Creek & Macaulay Mountain Conservation Area further the goal of teaching and experimenting with natural resource sciences. Community outreach events focused around wildlife and habitats have included the 'nature days' community outreach program, Mohawks of the Bay of Quinte days at the Frink Centre, and the 'Streams of Dreams' programs offered at local schools. Table 2 on the following page is a summary of the public education properties.

Table 2: Current Educational Programing/ Opportunities:

Properties	Educational use
MF.140.Vanderwater CA MF.139.Rapids Road	Sites provide for commercial forestry demonstration/education; permanent forest sample plots, forest carbon plots, diversity of forest plantations in varying stages of thinning activities and a wide variation of natural forest type; site utilized for group QC outdoor education programs and events
Longwell Farm	Site provides varying ecotypes (Palliser Creek watercourse channel, hardwood swamp, upland forest, tree planting trials); and actively farmed, delayed cut - hay fields which provide an extensive area of grasslands
MF.158.Foxboro Marsh	Site of historic wetland impoundment (earthern dykes) to restore marsh habitat (from former agricultural drainage) and recent level ditching within cattail matts (to increase edge habitat)
MF.155.Frink Centre	The main public school educational facility in the area since the 1970s; several forest and wetland types, including plantations, second growth forest, tolerant hardwood, marsh and riverine floodplain swamp; site utilized for group QC outdoor education programs and events
MF.130.Potter Settlement	Site of structural diversity thinning enhancement in Red Pine plantation; and recovery from the 2022 Actinolite tornado event
MF.109.O'Hara Mill	Site of a 'pioneer village' and historic (seasonal) water powered saw mill
MF.120.Whytock CA	Site used by local Municipality as parkland; offers excellent location for education regarding plantation management and naturalizing creek floodplain/riparian area
MF.108.Ackerman	Site of an abandoned gold mine and early settlement; rehabilitated mine shafts, arsenic clean-up (adjacent Deloro Mine rehabilitation), waste rock piles
MF.135.Sheffield CA	Site of significant natural features (ANSI) and a 'dark sky' viewing platform
MF.203.Depot Lakes.south	Significant for recreational access to interior camping site and passive water recreation (i.e. canoe/kayak) usage
Massassauga Point Conservation Area	Invasive species control and prescribed burning to enhance rare alvar woodland type
Little Bluff Conservation Area	Significant recreational access for tourists to PEC; site offers bluffs, pebble beach, coastal wetland on Lake Ontario plus heritage grain shipping silo
Potter Creek Conservation Area	Southern portion fronts onto the Bay of Quinte; site utilized for group outdoor education events
Macaulay Mountain Conservation Area	Highly used by the public, and used for group outdoor education

1.4 FOREST ADMINISTRATION

The management of the QC Forest is overseen by the Conservation Forester, with ultimate responsibility residing with the Quinte Conservation Board of Directors. Input on forest management is provided by communication with key stakeholders including:

- Quinte Conservation Board of Directors,
- Eastern Ontario Model Forest (EOMF) Forest Certification Coordinator,
- Harvest, Mill and Forest Management Contractors,
- Quinte Field Naturalist Club,
- Eastern Ontario Trails Alliance, and
- The O'Hara Mills Volunteers Association.

Indigenous perspectives are provided by the Mohawks of the Bay of Quinte and Alderville First Nation.

There are four controlled copies of the Forest Management Plan.

Table 3: Management Plan Copies

Copy #	Location
1.	Quinte Conservation Office Copy
2.	Forest Manager Copy
3.	GIS Specialist Copy
4.	Forest Manager (Spare Copy)

Controlled copies will be kept current, including any plan amendments. Additional uncontrolled copies will be made available as required, but uncontrolled copies may not contain all plan amendments.

The Plan shall be reviewed at the 10-year mid-point to ensure currency and relevancy, and revised where appropriate. Plan amendments can occur at any time, but will generally be limited to major changes in property ownership, strategic direction or management standards.

1.5 STRATEGIC DIRECTION

The Forest is managed in accordance with the strategic direction provided in three documents to accommodate a wide variety of values and uses:

- Conservation Lands Strategy (2023)
    - Guiding Principles and Objectives
    - Land Use Categories
    - Programs and Services
    - Land Use Policies
    - Acquisition and Disposition Policy
- Conservation Area Upgrade Strategy (2023)
    - Goals and Objectives
    - Description of Individual Conservation Areas
    - Policies for CA Management
    - Prohibited Activities
    - Measurable Achievements
- Quinte Conservation Lands Backgrounder (2024)
    - Introduction to the QC Forest lands
    - Categorization of all QC properties

The current versions of these documents are included within the FMP as appendix 1. Should these documents be updated, the strategic direction in the FMP will be considered as amended to the revised version. These documents are also available on the Quinte Conservation website:

https://www.quinteconservation.ca/en/outdoor-spaces/reports-and-studies.aspx

1.6 LEGISLATION AND OTHER REQUIREMENTS

In addition to the QC Property Policy Manual (office consolidation in 2019), the QC Forest is administered in compliance with numerous legislative and voluntary protocols which include;

LEGISLATION:

A list of applicable federal and provincial legislation with potential to affect forest management operations on the QC Forests is found in Table 4 on the following page. The EOMF Certification Coordinator provides Forest Managers with regular updates to applicable legislation.

ONTARIO MANAGED FOREST TAX INCENTIVE PROGRAM (MFTIP):

The Managed Forest Tax Incentive Program encourages good forest management by giving a property tax reduction to eligible landowners (including CAs) who prepare and follow an approved Managed Forest Plan. MFTIP plans were originally written for properties of the Moira River, Napanee Valley and Prince Edward Region CA in 1998. They have been updated, the current term is 2018 - 2027. The current MFTIP plans cover 10,465 hectares, which includes all lands of the QC Forest greater than 4 hectares in size which are not registered in the Conservation Land Tax Incentive Program (see below).

ONTARIO CONSERVATION LANDS TAX INCENTIVE PROGRAM (CLTIP):

The Conservation Land Tax Incentive Program recognizes, encourages and supports the long-term private stewardship of Ontario's provincially important natural areas through tax relief. Natural areas eligible included in the QC Forests are Areas of Natural and Scientific Interest (ANSI), provincially significant wetlands (PSW) and community conservation lands (CCL). A summary of area of CLTIP lands is included as in table 5 on the following page.

Table 4: Legislation Applicable on the QC Forest

Aggregate Resources Act	Heritage Hunting and Fishing Act
Assessment Act	Invasive Species Act
Beds of Navigable Waters Act	Lakes and Rivers Improvement Act
Bees Act	Lands Title Act
Boundaries Act	Line Fences Act
Clean Water Act	Migratory Birds Convention Act
Climate Change Mitigation and Low-carbon Economy Act	Municipal Act
Conservation Authorities Act	Occupational Health & Safety Act
Conservation Land Act	Occupier's Liability Act
Conveyancing and Law of Property Act	Off-Road Vehicles Act
Dangerous Goods Transportation Act	Ontario Heritage Act
Drainage Act	Ontario Trails Act
Employment Standards Act	Pesticides Act
Endangered Species Act	Planning Act
Environmental Assessment Act	Plant Diseases Act
Environmental Bill of Rights	Professional Foresters Act
Environmental Protection Act	Road Access Act
Fire Protection and Prevention Act	Trespass to Property Act
Fish and Wildlife Conservation Act	Weed Control Act
Forest Fires Prevention Act	Wild Rice Harvesting Act
Forestry Act	Wilderness Areas Act
Forestry Workers Lien for Wages Act	Workplace Safety and Insurance Act

Table 5: QC Forest CLTIP

Natural Area Type	Area (Hectares)	Area (Acres)
ANSI	1322	3266
PSW	828	2047
CCL	370	914
Total	**2520**	**6227**

FOREST CERTIFICATION

Forest certification involves the independent evaluation of forestry practices to a common standard, which can be used to label forest products such as lumber or paper as harvested from a well managed forest. In order to demonstrate forest sustainability and good management practices to the public, in 2019 QC obtained certification through the Forest Stewardship Council® (FSC®) under the Eastern Ontario Model Forest's (EOMF) group forest management certificate (FSC® C018800).

The EOMF was originally certified in 2003 under the FSC standard. The certificate permits the EOMF to incorporate private lands and community forests under their umbrella certificate. Forest owners like Quinte CA must sign a Memorandum of Understanding with the EOMF and commit to following certification standards, policies and operating procedures. The key documents which apply locally are the Forest Stewardship Council Canada – Certification Standard for the Great Lakes/St. Lawrence Region and the EOMF Forest Certification Policies and Procedures Manual – 2024. By following these documents, forest managers adhere to a rigourous sustainable forest management system.

Yearly audits are performed to retain this certification. FSC certification provides our residents with the assurance that their forests are managed to a world-recognized standard. FSC certification also positions Quinte CA to benefit from the sale of carbon offset credits (under the improved forest management category) and certified wood should markets develop for FSC certified lumber, poles, paper or firewood. By joining with the EOMF Quinte CA has become part of a network of forest managers who share best practices and information for continual improvement.

In February 2024, the Model Forest expanded their Certification Program and achieved Sustainable Forestry Initiative® (SFI®) (SFI-02042) certification as well, and Quinte Conservation has joined this program. As of 2024, the area now certified under the EOMF program is over 93,000 hectares and includes 15 community forests.

CARBON PROTOCOL

Beginning in 2017, the EOMF began to investigate opportunities in the carbon offset market for Forest Certification Program members. The objective for developing a Community Forest Carbon Offset Program was to provide forest owners an opportunity to add value to their managed forests through the generation and sale of carbon (and biodiversity) offset credits. EOMF has formalized a partnership with Bluesource Canada (now called ANEW Carbon), an experienced partner which currently develops carbon offset credits in North American jurisdictions. ANEW provides the initial funding for the project that would otherwise be cost prohibitive for the Community Forests to develop on their own. The cost of developing an offset that can be monetized include a detailed forest inventory and meeting a verification protocol which is audited by a third party. These costs are only recovered by ANEW if/when the carbon has been successfully taken to market. ANEW collects a commission on profit from the sale.

Improved Forest Management (IFM) projects are recognized offset protocols for both the voluntary and compliance markets. American Carbon Registry (ACR) IFM projects on working forestlands reward current and ongoing maintenance of carbon stocks above the baseline scenario. A baseline harvest regime is calculated where by the most aggressive & legal timber harvest scenario is calculated for a 10-year liquidation of the standing stock. The reduction of forest harvest activities below this baseline allows more standing timber to remain on site, absorbing carbon and performing other valued ecological goods and services and generating carbon offset credits.

At the approval of the QC Executive Board, a ‘carbon marketing and sale’ agreement was signed with Bluesource Canada in June of 2020. The forest carbon project was the first registered with the ACR for all of Canada (B.C. and Alberta have their own internal registry). Revenue from the program began in 2024.

Quinte Conservation is committed to utilizing the forest carbon revenue stream to maintain stewardship and outreach programming, while assisting with providing capital for the maintenance of fencing, signage, gates, access lanes, harvest monitoring and reporting, biological inventories, etc. on the property holdings of the Authority.

1.7 ENVIRONMENTAL MANAGEMENT SYSTEM

The environmental management system (EMS) for the QC Forest comprises a series of documents which address the strategic direction, forest level planning and site-specific planning and implementation (Table 6). The goal of the EMS is to provide a framework for the sustainable management of the QC Forest and the ongoing assessment of the health and ecological integrity of forest ecosystems and natural and cultural heritage values.

Forest level planning documents follow the strategic direction laid out in Section 1.5. The Forest Management Plan and High Conservation Value Forest Report are the descriptive Community Forest planning documents. There are also three types of prescriptive Community Forest level planning documents. The discussion paper for the Commercial Forest properties serves as the Ten-Year Operating Plan and covers the period until December 31, 2027. This will be updated with a new Ten-Year Operating Plan for the period 2028 – 2037 at the time of MFTIP plan renewal. Reporting of forest management activities is carried out every 5 years as required by MFTIP, and the Forest Manager also provides annual reports of activities to both the Quinte Conservation Board of Directors and the EOMF Certification Coordinator. Standard operating procedures for forest operations such as tree marking, road construction, water crossings, and harvesting are described within the Eastern Ontario Model Forest (EOMF) Forest Certification Program Policy and Procedures Manual (2024).

Forest management activities on the Forest are implemented according to a site-specific harvest plan/ prescription prepared by a member of the Ontario Professional Foresters Association (OPFA) (Section 6.3) and a Stumpage Sale Contract (Section 6.6). Harvest activities and other uses of the forest are monitored by the Forest Manager and documented on Pre-Harvest Meeting, Forest Operations Inspection, and Community Forest Inspection Forms.

Table 6 Environmental Management System: Quinte CA Forest

DOCUMENT	CONTENTS SUMMARY	KEY REFERENCES
Strategic Documents		
Conservation Lands Strategy (2023)	Guiding principles and objectives for all the Quinte CA Forest Lands. Definition of Land Use Categories Land Use Policies	Founding Reports for Moira Valley (1955), Napanee Valley (1957), and Prince Edward Region (1968) Conservation Authorities. https://www.quinteconservation.ca/en/outdoor-spaces/reports-and-studies.aspx
Conservation Area Upgrade Strategy (2023)	Strategic direction for Conservation Areas.	https://www.quinteconservation.ca/en/outdoor-spaces/reports-and-studies.aspx
Quinte Conservation Lands Backgrounder (2024)	Listing of all properties by land use category Information on cultural heritage, flora and fauna, wildlife, watershed forest history, forest certification, forest carbon offset program, special forest sites, geological features	https://www.quinteconservation.ca/en/outdoor-spaces/reports-and-studies.aspx
Community Forest Planning Documents		
Forest Management Plan (FMP) (January 1, 2026 to December 31, 2045)	Strategic Direction Environmental Management System Forest History Forest Ecosystems: Forest Types and Silviculture Natural and Cultural Heritage Values Forest Health Forest Products Monitoring and Assessment	OMNR 2015: Forest Management Guide to Silviculture in the Great Lakes-St. Lawrence and Boreal Forests of Ontario OMNR 1998a: A Silvicultural Guide For the Tolerant Hardwood Forest in Ontario, OMNR 1998b: A Silvicultural Guide For the Great-Lakes-St. Lawrence Conifer Forest in Ontario OMNR 2000: A Silvicultural Guide To Managing Southern Ontario Forestss OMNR 2010: Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales. MFTIP Plans 2018-2027
HCVF Report	Analysis of High Conservation Value Forests for the QC Forest	OMNR NRVIS Data https://www.quinteconservation.ca/en/watershed-management/resources/Documents/Final.HCVF_QuinteCA_Sept12_2019.pdf

Commercial Forest Properties (2019)	10 Year Operating Plan for Commercial Forest Properties (2019-2027)	https://www.quinteconservation.ca/en/outdoor-spaces/reports-and-studies.aspx https://www.quinteconservation.ca/en/watershed-management/resources/Documents/Commercial%20Forests/2023%20QC%20Forest%20Harvest%20Schedule.pdf
Five Year and Annual Reports	Activity reports at years 5 and 10 of MFTIP plan. Annual summary of operations completed by the Forest Manager on the Community Forest. 1) Board of Directors 2) EOMF Certification	
EOMF Forest Certification Program Policy and Procedures Manual (Information Report 51 Version 6 2024)	Policies for certified forest owners Specific qualification requirements for activities (eg certified tree markers) Standard operating procedures for forest operations including tree marking, road construction, water crossings, and harvesting.	
Site Specific Planning and Implementation Documents		
Harvest plans/ prescription	Forest and site specific silviculture prescription and map Directions for tree marking, logging and establishment of areas of concern.	OPFA 2010: Practice Bulletin 10: Minimum Content For Prescriptions For Partial Harvesting on Private Land in Ontario OMNR 2004: Ontario Tree Marking Guide. Version 1.1
Stumpage Sale Contract	Requirements for wood measurement and payment, contractor qualifications and forest operating standards.	
Pre-Harvest Meeting Form	Checklist of harvesting requirements completed prior to start-up	
Forest Operations Inspection Forms	Documentation of assessments of harvest operations carried out by Forest Manager to ensure compliance with standards.	
Community Forest Inspection Form	Documentation of findings and recommendations of property inspections carried out by Forest Manager.	

2.0 FOREST HISTORY (Sources: EOMF, 1993. EOMF, 1999. Ontario Government, 1950 and 1957. Quinte Conservation, 2022 (Draft Report))

2.1 THE ORIGINAL FORESTS AND INHABITANTS (PRE 1783)

The forests of the Quinte CA watershed were essentially continuous prior to 1783 with the exception of open water wetlands, wet grassy meadows and alvars. In the hundred-year period that followed the forested landscape was completed altered.

The original forests of the area can be differentiated by their underlying bedrock: the southern portions are limestone-based, the northern areas are underlain by precambrian igneous rock, the Canadian Shield. The forests of the southern portion were predominantly hardwood. Hard maple was the dominant species, but basswood, beech and white pine were common components. On sandy soils, white pine sometimes became the dominant species. Oak was more prominent in the most southerly areas of the watershed on the Prince Edward escarpment slopes and the Oak Hills area. These forests were dominated by red, white, black and bur oak, with components of shagbark and bitternut hickory and white pine. Mineral soil swamps were dominated by white elm, soft maple and black ash, although areas of white pine occurred where minor increases in topography allowed for slightly improved drainage. In peat and muck swamps conifers like spruce, cedar, balsam fir and tamarack were more prevalent. On the Canadian Shield the rocky, shallow soils had limited agricultural potential, but contained vast expanses of forest including white and red pine, hemlock, hard maple, ash, elm, beech, basswood, red oak, cedar and birch. Treed swamps dominated by cedar, tamarack, black ash and spruce and grassy meadows occupied small areas between the upland areas.

The Bay of Quinte and its tributaries were long inhabited by First Nations prior to first European contact. The Bay provided sheltered travel routes from the open water of Lake Ontario and a source of abundant food resources. The First Nation settlements that were present after European contact but prior to settlement were heavily influenced by the fur trading alliances and conflicts of rival European countries. The French established trade connections with the Mississauga Nation (Anishinaabe), and the English with the Mohawk Nation (Haudenosaunee). The Mississauga

relied on hunting venison, gathering berries, and cultivating wild rice, while the Mohawk formed part of the Iroquois Confederacy and cultivated crops (the three sisters: corn, beans and squash).

Forest clearing by the Iroquois nations for agriculture would have been minimal. There is some early evidence (circa 1670s) of large palisaded villages being found at the isthmus dividing the Bay of Quinte from Lake Ontario (near the Carrying Place) and near the present Town of Napanee. There were likely other settlements at the mouths of the other rivers entering the Bay of Quinte, and the inland waters of the Prince Edward peninsula. The Mississauga Nation had settled along the Bay of Quinte by the 1700s. Mississauga settlements were typically small and were moved regularly. Although they did use Iroquoian agricultural methods, the fact that they moved regularly meant that the evidence of forest disturbance from their settlements quickly disappeared after they left.

2.2 PIONEER SETTLEMENT AND FOREST USE (POST 1783)

The late 1700s brought about new settlement patterns and major changes to the forests of the Quinte CA watershed. The initial impetus which drove the new settlements in the Bay of Quinte area was the American Revolution. United Empire Loyalists (UEL - loyal to the British Crown) were driven from the United States and looked to England to assist with their relocation. By 1780 thousands of displaced persons were living in what is now Canada. To provide a source of livelihood to these people, the British government decided to issue land grants along the north shore of the St Lawrence and Lake Ontario.

The Royal Proclamation of 1763 required the Crown to engage in a treaty-making process with the First Nations prior to settlement. In 1783 the Crawford Purchase from the Mississauga Nation included the lands on the north shore of the Bay of Quinte from the Gananoque River to the Trent River and those lands which are now Prince Edward County (PEC).

One of the first groups of UEL to arrive were Mohawks led by Chief John Desertyon. They were granted a large tract of land on the north shore of the Bay of Quinte in 1784, known as the “Mohawk Tract”. Surveys of the fronts of the first 10 townships commenced by 1784 including

four townships from Cataraqui (now Kingston) to Adolphus Reach, three townships along the north shore of PEC, and Sidney, Thurlow and Richmond townships, which were on either side of the Mohawk Tract. The early clearing of the forests around the Bay of Quinte eventually resulted in severe soil erosion due to the lack of crop rotations.

Initially settlement proceeded sporadically through the townships and was concentrated close to waterways. Lots were being assigned by 1784, but the surveys of the interior concessions took time. Settlers selectively sought out land which could be cleared and farmed quickly, focusing on rolling, well drained, loamy soils. In the aftermath of the War of 1812, the Napoleonic wars, and the industrial revolution, new settlers to the area were often displaced people from Scotland and Ireland. By the 1820s settlement had started to proceed into the interior areas which hastened the rate of forest clearing.

New settlers consumed forest products for the construction of log (and later frame) houses, barns, roofing shingles, fences, and farm implements. Later, oak, pine, elm, tamarack, and cedar were targeted for use in ship building, and hemlock was cut only to be stripped of its bark for tanning. Some black walnut, butternut, and hickory were cut for furniture manufacture, as were ash, birch, maple, and beech. Early farm tools and vehicles would have consumed hickory, beech, ironwood, rock elm, and white ash, while white pine was preferred for building framing & cladding.

Because of the challenges with clearing and farming the relatively poor land, many men left their wives and children to go lumbering in the winter. “Settlement and lumbering were carried on simultaneously in the watershed, the one helping to develop the other as long as the timber lasted. Lumbering provided winter employment for the settlers and a convenient market for hay and other products. (Ontario Government. 1950).”

In the 1820s and 1830s the activities of shipbuilding, refortification, road improvement and canal building all created demand for wood products. Steamships started travelling from the Bay of Quinte eastward, allowing for export of products from back settlements. Small water-powered sawmills would be set up along the rivers. Each sawmill provided employment and a nucleus for settlement. Inevitably the owner would add a grist mill to service the new farms surrounding the

mills. The increased market for flour exports allowed more fields to be cleared. Primitive roads which used wood corduroy to cross low, wet areas would be built to connect settlements, increasing the access to the forest. The discovery of iron ore in the 1820s resulted in new settlements further north in Marmora and Madoc townships which became new sites for saw and grist mills. In the 1840s, road improvements were being carried out with the installation of plank roads which required large volumes of timber. The growth of villages occurred reflecting the increased demand for consumer goods, many which were made from wood. Tanneries, cabinetmakers, wheelwrights, cooperages, cheesebox manufacturers, and asheries (potash) all made use of locally derived wood products.

Settlement in the southern townships was effectively completed by the 1850s, but settlement into northern areas continued until the late 1800s. New roads, like the Hastings settlement road of the late 1850s continued to improve access for settlement. As local timber resources declined the area of improved (cleared) farmland increased and there was a gradual change from seasonal lumbering to full-time farming.

Massive amounts of wood were consumed by early industrial ventures in the watershed. These included cribbing & walls for the construction of the Murray canal and the lower Trent River lock system, the early smelting of iron ores at Marmora & Madoc, the later smelting of copper & gold ores at Eldorado, Bannockburn, Malone, and Deloro, the lime kilns at Marlbank, and the industrial brickyards at Napanee. Hemlock timber was consumed in cribbing, walls, and floors of early mine shafts. Railroad construction across the watershed required wood for ties and bridges. Until 1850 wood was the sole source of fuel. Early industry required twenty-five cords of hardwood to make about one thousand bushels of charcoal; and 150-175 bushels of charcoal was needed to smelt one ton of ore. Even early woollen mills had a stove that heated the combs for separating fibres. Early steam ships and locomotives consumed massive amounts of cordwood as fuel. Total annual fuelwood production of 277 663 cords was reported in Hastings, Lennox and Addington, and Frontenac Counties in the 1870 agricultural census.

Oak was used in the construction of waterwheels, cogs, and spindles that drove water powered mills. Massive amounts of oak were also consumed for the construction of cider barrels and the

drying floors of cheese factories. The area around the Cameron Swamp (Camden Wetland Complex) was noted for the concentration of shingle producers, likely due to the high-quality white cedar which would have been found in such an extensive swamp complex.

All these activities had an inevitable result on the forests of the watershed. Forest cover was certainly greater than 90% prior to 1784. According to initial Census of Canada figures from 1850, forest cover on occupied farms in Hastings and L & A Counties had already declined to 40 to 60%. By 1910 only about 18% remained as woodland. In the townships closer to the lake, the decline was even more obvious. By 1910 in Thurlow Township, forest cover was reported as low as 7%. Major changes in tree species occurred as the most favoured species such as white and red pine were selectively removed from the forest. Species that were adapted to disturbance such as red oak, poplar and white birch thrived in the harsh conditions.

It is critical to recognize the contribution of fire and grazing to the fundamental changes in the landscape over the last 200 years. Fires were deliberately set by settlers as a means of clearing land. The debris left after logging operations became a major source of fuel for wildfires. Commencing in the mid-1850's the construction of railway lines created a new source of fire danger as sparks and coals were emitted from coal-burning engines. Frequent, prolonged and out of control wildfires were reported throughout the watershed from 1850's to 1930's, regularly compounded with uncontrolled grazing. This caused massive soil compaction in wetlands and erosion from uplands, which in turn severely hampered the development of tree seedlings. Fires appear to have been a more prominent factor in the north part of the QC Forest, while overgrazing played a major role in the south. Finally, periodic flooding in the land devoid of its forest, contributed to the damage. Over several decades, all of these factors combined depleted the fragile topsoil, obstructed natural regeneration of the forest and eventually left many areas reverting to 'barren wasteland'.

2.3 FOREST RECOVERY (1910 TO TODAY)

The 20th century saw a marked reduction in land clearing and harvest levels and a subsequent gradual recovery in forest cover. By early 1900s, the accessible timber limits along the river systems were exhausted, resulting in greatly reduced rates of harvesting. Most remaining sawmills and new pulp mills shifted their focus to the hardwood forests. With the advent of coal and other fuels wood use declined. Many marginal agricultural lands were abandoned due to poor fertility and changes in farming technology, leading to the establishment of new forests by natural means and through tree planting programs. The first free distribution of trees by the Ontario government was in 1905. The County of Hastings was the first in Ontario to show interest in reforestation and appointed a Reforestation Committee. Destructive fires, both natural and man-made were greatly curtailed through aggressive fire fighting programs. Forest surveys in 1948 show that forest cover was 30% in the south part of the Moira watershed and 29% in the Napanee watershed. Today Quinte CA reports indicate that the Moira watershed is 64% forest cover, and the Napanee watershed 53%. Current forest cover in Prince Edward County is 32%.

Insects, disease, abiotic stresses, and wildlife populations continue to impact the composition of the forest. The first major invasive pest which affected the local forests was dutch elm disease. White elm, which was once a common species, started its precipitous decline in the 1950s. Since that time many other invasive species and have affected the composition of the QC Forest (see section 5.0 Forest Health). In more settled areas, deer populations have reached levels where regeneration of many species is prevented by browsing.

The forests of today reflect both natural processes and recent history: most forests are between 80 and 120 years of age, which reflects this period of forest recovery and reduced disturbance levels. Tree species affected by invasive forest pests may exhibit declines, while those which are more adapted to lesser levels of disturbance like sugar maple continue to increase in prominence. Section 3.0 provides a detailed description of today's QC Forest.

3.0 FOREST ECOSYSTEMS OF THE QC FOREST

3.1 FOREST RESOURCE INVENTORY (FRI)

Quinte Conservation maintains an in-house GIS mapping system which describes forest and natural heritage values for all of their properties. The last OMNR FRI for the area of the Quinte Forest was produced from 1978 photographs, this FRI was used to delineate forest polygons. FRI data provides a good approximation of forest type but has limitations. For example, species composition and age are estimates based on the largest trees in the overstory as interpreted from an aerial photograph. FRI cannot be used to describe the mid and understory composition of a forest. FRI information is verified as required on the ground by the Forest Manager.

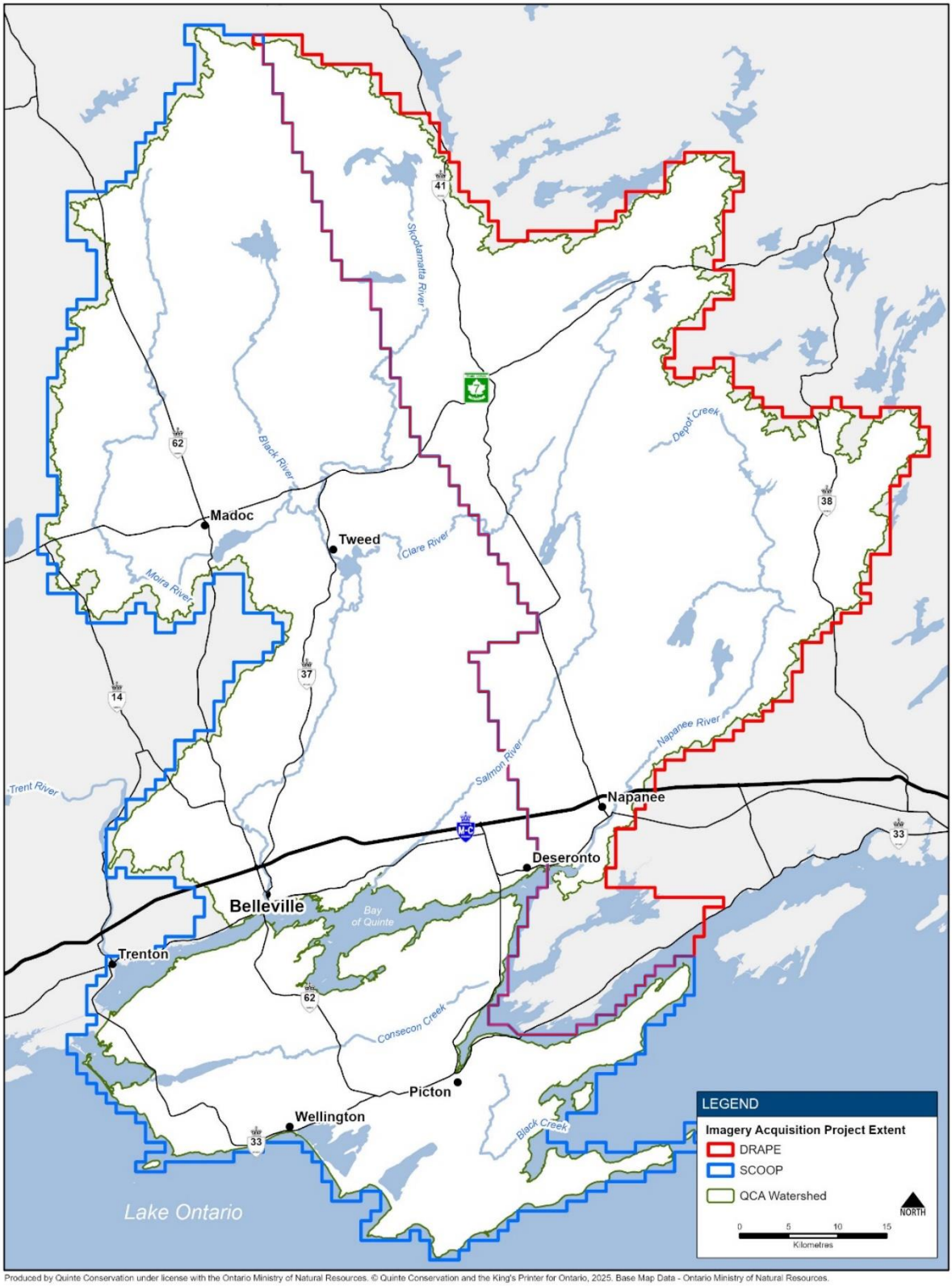
Roads, natural heritage and cultural values information are all based on OMNR data sources supplemented with local knowledge.

The Quinte watershed covers two photo imagery updating regions which are offset by one year (see Map 2). The east side of the watershed (Lennox-Addington and Frontenac Counties) is covered by DRAPE (Digital Raster Acquisition Project Eastern Ontario) and the west side (Hastings and Prince Edward Counties) is covered by SCOOP (South Central Ontario Orthophotography Project) These are both cooperative projects sponsored by many partners including the OMNR, Conservation Authorities, and municipalities. The most recent photography was flown in 2023 (SCOOP) and 2024 (DRAPE). For topography information the CA has a 2021-2022 LIDAR-derived digital elevation model.

The forest inventory has been maintained and updated by Quinte CA as follows:

1) 1998: MFTIP Plans were written for the lands of the Moira Region and Napanee Region CAs by Jan Smigielski, RPF. These plans comprised 7817 ha (19,308 acres) in the Moira Region and 4237 ha (10,465 acres) in the Napanee Region of the current Quinte CA Forest. The size of the property, time and accessibility constraints did not allow for complete field inventory of the entire land base, however the entire area was examined and evaluated in

Map 2: Quinte Conservation Imagery Acquisition Projects



detail using aerial photography. This was supplemented with 1444 Ha (3567 ac) of field surveys. The MFTIP plan for the lands of the Prince Edward Region Conservation Authority was created by David Smallwood, Associate R.P.F. These holdings represented another 192.4 hectares (475 ac), and all were field sampled.

2) 2018: The MFTIP Plans for the Quinte Conservation Forest were updated. Two technicians were hired for one year to carry out field sampling to update the FRI data. The field sampling covered 9,264 ha (22,882 acres).

3) 2022: 199 permanent inventory plots were established by Bluesource (Anew) to provide data for the Forest Carbon Offset Program. At each plot location a 1/25th-hectare (11.28m radius) fixed-radius plot was established to measure all trees greater than or equal to 9.0cm in diameter at breast height (DBH); and a 1/200th-hectare (3.99m radius) sub-plot was taken to capture woody trees and saplings less than 9.0cm (2.0cm to 8.99cm DBH). This plot design gives forest managers the opportunity to consistently track the growth and development of specific trees over an extended timeline.

   A sub-sample of the plots are remeasured at five-year intervals, with full project-level inventory of the carbon project at 10 year intervals for the 40 year duration of the project. Inventories of portions of the QC Forest will be updated periodically in response to natural disturbance or significant forest management activities. If a plot is harvested, the plot will be re-measured at the end of the reporting period so that the inventory can be updated.

4) 2025: Quinte CA took ownership of the 1978 FRI interpreted aerial photographs for the old OMNR Tweed District which had been in storage at the Mazinaw-Lanark SFL office. While not a complete set, these photographs, the site-specific knowledge of the Forest Manager, and additional field sampling were used to complete the forest polygons for the rest of the Quinte CA Forest.

5) 2025: All forest polygons will be updated with LIDAR-based data produced by a project of the Ontario Woodlot Association (OWA). This inventory was supported by the Forest Carbon Offset plots and another 171 field plots field plots established on the Quinte CA Forest specific to the OWA project.

Additional field inventory will support the updating of the MFTIP plans and development of a new Ten – Year Operating Plan which will commence January 1, 2028. Other FRI updates will reflect activities that result in substantial changes to the natural or physical features. Typical of many community forests, the level of forestry activity is quite low on the Quinte Forest and is generally restricted to the Commercial Forest, which represents 18.4% of the total area (Table 8A).

All area information in the following tables is based on the FRI area calculated with the GIS system, not deeded property area. FRI and deeded areas vary due to differences between the mapped lot fabric and actual property boundaries as delineated on-the-ground through surveys and fencing. Actual property boundaries are verified in the field by the Forest Manager.

3.1.1 MAP PRODUCTS

Appendix 2 contains the map products which have been produced for this plan and supporting forest stand data. These include compartment maps showing forest types and natural heritage and cultural values, and aerial photographs. Where confirmed with field evidence, the maps indicate both the lot fabric and actual property boundaries.

3.2 GEOLOGY

The Quinte Conservation Forest is unique in the range of bedrock geology which it covers, which is described in detail in the Quinte Conservation Lands Backgrounder (2024) included in Appendix 1. This variation results in distinct and interesting forest types and tree species.

3.3 LAND-BASE AND FOREST SUMMARY

Tables 8A and 9A summarize the lands and forests of the QC Forest based upon the FRI areas. The forests have been grouped into ten forest types, which are stands with similar tree species and/ or site conditions. Forest type definitions are provided in appendix 3. The description of the characteristics and management of the forest types follows in section 3.4.

"The forests of eastern Ontario lie within the Great Lakes-St. Lawrence (GLSL) Forest Region, south and east of the Canadian Shield. The GLSL Forest Region occupies a broad geographic range in Ontario and Quebec as well as south-eastern Manitoba and northwestern New Brunswick. The forests are dominated by sugar maple and beech, with red maple, yellow birch, basswood, white ash, largetooth aspen and red and bur oaks. (EOMF, 1999)" White oak, green ash, white birch, rock elm, blue beech and bitternut hickory occur intermittently. "Black ash is common on poorly drained areas which may also include black spruce and eastern white cedar. Eastern hemlock, eastern white pine and white spruce are common on shallow, acidic or eroding materials. White pine, red pine and red oak are common on coarse textured drier soils. (EOMF, 1999)" There are however unique examples of Carolinean forest species (e.g Chinquapin Oak, Black Maple, Hackberry) in the southernmost parts of the watershed.

The forests of eastern Ontario have been heavily influenced by the previous 200+ years of European settlement. The Community Forests are typically second growth and have been heavily disturbed by fire, logging and agricultural settlement. They contain a wide diversity of native hardwoods and conifers, numbering over 30 tree species. As a result of disturbance, many early to mid-successional tree species are present which have regenerated either naturally or through the planting of trees. Many of these species such as red oak, white birch, poplar and red pine are present in greater quantities than were originally found on the landscape. Many other species are greatly reduced in abundance from their pre-settlement distribution, either due to harvesting (e.g. white pine, hemlock) or to introduced pests (e.g. white elm, ash).

The forest cover for Quinte CA generally increases from south to north with the decline in agricultural capability. The CA reports on forest conditions in Watershed Report Cards (2023).

Table 7: Quinte CA Forest Conditions (2023)

Watershed	Forest Cover	Interior Forest	Riparian Area with Forest Cover
Moira River	64%	19%	61%
Napanee Region	53%	16%	50%
Prince Edward Region	32%	7%	44%

75.8 % of the area of QC properties are forested and 24.2 % are non-forest lands, most of which are associated with wetlands, water bodies and rock. 67.3 % of the forested lands are hardwood-dominated and 32.7 % are conifer-dominated. Only 4.8 percent of the QC forested lands are red pine plantations.

87.5% of the forests on the QC Forest are younger than 100 years of age. Even the older stands have not been excluded from the heavy disturbances of the past, although they may retain a component of older trees that have been identified in the FRI. For example, a previous farm woodlot that was tapped for maple syrup may contain trees that are older then 200 years of age, but likely lacks the structure and diversity of an old growth forest. For further discussion of old forests, refer to section 4.6 Special Forest Sites.

The reduction in natural wildfires and indigenous burning has also had an impact on the forest. The limited number of oak and white pine forests under the age of 60 can be partially explained by this phenomenon. If these species are to be maintained on the landscape over the long-term, silvicultural strategies including tree planting, tending of natural regeneration and/ or prescribed burning will need to be considered.

The QC Forest continues to evolve. Many early successional forests and plantations are changing with time, as regeneration of later successional tree species such as sugar maple, hemlock and white pine develops in the understory. With time and proper forest management, the forests will continue to grow and develop and will slowly return to a species composition and age class more similar to their pre-settlement condition. The anticipated trends in forest type succession are described in detail in Section 3.4.11. The forest management standards for each forest type are designed to complement the processes of natural succession, while emphasizing improvement in timber quality through removal of poor quality stems and regeneration of a diversity of tree species that are adapted to the site conditions.

Note: Tables 8B and 9B have been converted to imperial measurement (acres). All figures and references in the FMP are derived from tables 8A and 9A, metric measurement (hectares).

Table 8A Quinte CA Forest: Forest and Open Land Summary (Area in Hectares)

Forest Type	Conservation Reserve	Commercial Forest	Conservation Area	All Lands
Hardwoods				
Upland Tolerant Hardwood	1459	431	211	**2101**
Oak	1363	105	620	**2088**
Hardwood Shelterwood	1267	168	87	**1522**
Lowland Hardwoods	380	108	37	**525**
Intolerant Hardwoods	328	65	7	**400**
Sub-total Hardwoods	**4797**	**877**	**962**	**6636**
Conifers				
White Cedar	465	101	80	**646**
White Pine	537	387	341	**1265**
Red Pine	102	331	40	**473**
Hemlock	51	55	7	**113**
Other Conifers	370	96	260	**726**
Sub-total Conifers	**1525**	**970**	**728**	**3223**
Open Land				
Open Wetland (marsh, fen, pond)	1387	535	281	**2203**
Bare Ground (rock barren, sparsely vegetated soil)	342	11	138	**491**
Lake / River	203	1	147	**351**
Shrubland	19	5	31	**55**
Developed (paved/gravel roads, mowed lawns, buildings)	4	0	18	**22**
Agricultural	34	0	0	**34**
Sub-total Open Land	**1989**	**552**	**615**	**3156**
Total Quinte CA Forest	**8311**	**2399**	**2304**	**13015**

Table 8B Quinte CA Forest: Forest and Open Land Summary

(Area in Acres)

Forest Type	Conservation Reserve	Commercial Forest	Conservation Area	All Lands
Hardwoods				
Upland Tolerant Hardwood	3604	1066	522	**5192**
Oak	3368	260	1532	**5160**
Hardwood Shelterwood	3131	414	215	**3760**
Lowland Hardwoods	939	266	92	**1297**
Intolerant Hardwoods	812	160	18	**990**
Sub-total Hardwoods	**11854**	**2166**	**2379**	**16399**
Conifers				
White Cedar	1149	249	198	**1596**
White Pine	1327	955	844	**3126**
Red Pine	253	818	99	**1170**
Hemlock	125	136	18	**279**
Other Conifers	915	236	643	**1794**
Sub-total Conifers	**3769**	**2394**	**1802**	**7965**
Open Land				
Open Wetland (marsh, fen, pond)	3427	1323	695	**5445**
Bare Ground (rock barren, sparsely vegetated soil)	845	28	338	**1211**
Lake / River	501	1	363	**865**
Shrubland	47	13	76	**136**
Developed (paved/gravel roads, mowed lawns, buildings)	11	0	44	**55**
Agricultural	84	1	0	**84**
Sub-total Open Land	**4915**	**1366**	**1516**	**7797**
Total Quinte CA Forest	**20538**	**5926**	**5697**	**32161**

Table 9A Quinte Conservation Forest:
Forest Type Age Class Summary (Area in Hectares)

Forest Type	1–20	21-40	41-60	61-80	81-100	101-120	121-140	Total
	Hardwoods (Hectares)							
Upland Tolerant Hardwood	24	12	91	498	987	433	56	**2101**
Oak	59	26	105	584	1132	168	14	**2088**
Hardwood Shelterwood	43	128	56	388	841	66	0	**1522**
Lowland Hardwoods	10	0	30	113	336	36	0	**525**
Intolerant Hardwoods	0	1	44	76	247	32	0	**400**
Sub-total Hardwoods	**136**	**167**	**326**	**1659**	**3543**	**735**	**70**	**6636**
	Conifers (Hectares)							
White Cedar	13	12	50	148	203	164	56	**646**
White Pine	6	46	173	493	469	68	10	**1265**
Red Pine	6	3	202	220	42	0	0	**473**
Hemlock	0	0	0	0	87	12	14	**113**
Other Conifers	14	38	411	92	70	83	18	**726**
Sub-total Conifers	**39**	**99**	**836**	**953**	**871**	**327**	**98**	**3223**
Total	**175**	**266**	**1162**	**2612**	**4414**	**1062**	**168**	**9859**
% Age Class	**1.8**	**2.7**	**11.8**	**26.5**	**44.7**	**10.8**	**1.7**	**100**

Table 9B Quinte Conservation Forest:
Forest Type Age Class Summary (Area in Acres)

Forest Type	1–20	21-40	41-60	61-80	81-100	101-120	121-140	Total
	Hardwoods							
Upland Tolerant Hardwood	61	29	225	1229	2440	1071	137	**5192**
Oak	145	63	259	1443	2801	416	33	**5160**
Hardwood Shelterwood	107	317	139	959	2076	162	0	**3760**
Lowland Hardwoods	24	0	74	279	831	89	0	**1297**
Intolerant Hardwoods	0	2	109	187	613	79	0	**990**
Sub-total Hardwoods	**337**	**411**	**806**	**4097**	**8761**	**1817**	**170**	**16399**
	Conifers							
White Cedar	33	29	123	366	502	405	138	**1596**
White Pine	15	113	428	1217	1161	168	24	**3126**
Red Pine	15	8	498	546	103	0	0	**1170**
Hemlock	0	0	0	0	215	29	35	**279**
Other Conifers	34	95	1017	227	172	204	45	**1794**
Sub-total Conifers	**97**	**245**	**2066**	**2356**	**2153**	**806**	**242**	**7965**
Total	**434**	**656**	**2872**	**6453**	**10914**	**2623**	**412**	**24364**
% Age Class	**1.8**	**2.7**	**11.8**	**26.5**	**44.7**	**10.8**	**1.7**	**100**

3.4 FOREST TYPES

The forests of the Quinte Conservation Forest have been grouped into ten categories of forest types with common tree species and site conditions. Forest type definitions are provided in appendix 3. These types are usually assigned according to the FRI description, but some have been assigned based on the Forest Manager's knowledge of the particular site.

3.4.1 UPLAND TOLERANT HARDWOOD

Upland tolerant hardwood forest associations on the QC Forest are the predominant forest type, comprising 2101 hectares and 21.3 percent of the total forested area. Tolerant hardwood forests are dominated by the shade tolerant tree species sugar maple growing on dry to moderately well-drained soils. The soils are often shallow and rocky, with low agricultural capability. Upland tolerant hardwood types typically occur on level to rolling sites, and on mid to lower slopes of sites with more rugged terrain. Typical associates on drier sites include beech, bitternut hickory, red oak, white ash, and ironwood while basswood is more common on fresh sites. A component of hemlock and/ or white pine is typically found on less disturbed sites. Other associates include red maple, white birch, white and bur oak, black cherry, white elm, butternut and trembling and largetooth aspen.

Advanced regeneration in upland tolerant hardwoods is generally dominated by the shade tolerant species sugar maple, beech and ironwood. Suppressed advanced regeneration of many mid-tolerant species (e.g basswood, red oak) will often be present within these stands. Mid-tolerant species may develop into saplings if located within crown openings and not impeded by competing vegetation.

The majority are between 61 and 120 years of age, with 81 to 100 as the dominant age class. The tolerant hardwoods forest type has the largest area of forests greater than 100 years of age. Tolerant hardwood forests less than 60 years of age are typically even-aged and have originated as a result of past heavy cutting or agricultural use, although two-aged stands with an overstory of large decadent trees are also common. Older stands usually exhibit an all-aged distribution.

SILVICS OF SUGAR MAPLE (From OMNR 1998a, OMNR 2000, and local knowledge)

- sugar maple has regular seed crops; seed production begins at about age 40 to 60 years.
- seedlings have a vigourous root radicle which easily penetrates leaf litter.
- sugar maple is shade tolerant: early growth can occur in as little as 5% of full sunlight.
- older seedlings persist under heavy shade but exhibit slow growth.
- sugar maple responds well to release at nearly all ages.
- excessive release of suppressed stems often results in epicormic branches and top decline.
- sugar maple is deep rooted and relatively resistant to windthrow.
- sugar maple is subject to a variety of stem infections such as eutypella and nectria canker.

The silvics of the other tree species of the upland tolerant hardwood forest type are detailed in Silviculture Guides produced by the OMNR.

LONG-TERM MANAGEMENT OBJECTIVE

Hard maple is a high value hardwood which is sought after for sawlog production. The rate of volume growth on these sites is moderate (typical yields of 800 to 1500 board feet per acre of sawlogs from light selection thinning on a twenty-five year cutting cycle of mature tolerant hardwoods), but high average value per board foot makes sawlog production a sound financial objective. Hard maple and hickory are also preferred species for firewood. Beech has traditionally been valued for mast production and firewood but is now in decline due to BBD and the subsequent beech root suckering can preclude regeneration of most other species. Limited beech trees which exhibit tolerance or resistance to BBD are retained.

The long-term management objectives for upland tolerant hardwood forests are:

- maintain a continuous forest canopy
- develop or maintain an all-aged forest condition
- improve the overall timber quality of the stands
- enhance/ restore the components of large trees, white pine and hemlock
- maintain/ regenerate a diversity of shade tolerant and mid-tolerant tree species

- maintain/ regenerate a component of minor tree species
- provide protection for significant wildlife habitat and wildlife trees

MANAGEMENT

The vast majority of upland hardwood forest types are managed using the single tree and group selection system. Table 10 summarizes the key parameters for selection management used on the forest. Detailed guidelines for selection management are provided in the Silviculture Guides produced by the OMNR.

Table 10: Silviculture Summary Upland Tolerant Hardwoods

Full stocking basal area		26 to 32 m2/ ha			
Desired residual basal area		18 to 22 m2/ ha			
Full stocking crown closure		85-100%			
Desired residual crown closure		65-75%			
Desired Structure	DBH cm	10-24	26-36	38-48	50-60
	BA m2/ ha	6	6	5	3
Cutting cycle		20 to 30 years			
Group openings		1 to 2 per hectare, ½ to full tree height			

3.4.2 OAK

Oak forests are equally significant, representing 2088 ha and 21.2 percent of the total forested area. Red oak is typically the dominant oak species, particularly on the Canadian Shield. South of the Shield white and bur oak increase in importance, and in the southernmost parts of the watershed minor components of black and chinquapin oak can be found. Oak ecotypes are distinguished by soil depth. Typically oak is found growing on shallow, rocky granite ridges or areas of shallow soils over limestone. Growth and stem quality are fair to poor in such cases. Scattered stunted oak can survive in the harshest rock barrens, although trees seldom grow to more than 6 to 8 meters in height in these situations. Typically oak grows with white pine, sugar maple, bitternut and shagbark hickory, poplar, hemlock and ironwood on shallow-soiled ecotypes. Taller, higher

quality oak trees can be found on drumlin landforms, lower and middle slopes and in deep soil pockets. On mid to lower slope ecotypes oak is found growing with all the tree species of the upland tolerant hardwood forest type.

The current distribution of oak is can be ascribed to the past history of settlement. The activities of land clearing, logging, and fires due to potash production, railroad engine sparks and logging slash which were common in throughout the 1800s and early 1900s created high light, low competition conditions in which oak thrived. The majority of oak stands originated during this period and are 80 to 100 years old. Most stands are even-aged. Prior to European settlement, burning by indigenous peoples also resulted in the creation of oak dominated savannas.

Advanced regeneration in oak forests is commonly the shade tolerant species sugar maple, beech and ironwood. Small oak seedlings may be present within these stands, although they are usually short-lived. Oak and white pine may develop into saplings on shallow-soiled sites, or if located within crown openings on better sites. Some oak species can be found as regeneration under other forest types with less dense crown cover. For example, bur oak regenerates well under ash-dominated stands, and red and white oak regenerate well under red pine plantations.

SILVICS OF RED OAK (From OMNR 1998a, OMNR 2000, and local knowledge)

- red oak has highly irregular seed crops; good seed years may occur every two to ten years, with complete failures in some years.
- acorn production begins at about age 20 to 30 years, and increases with diameter up to 60cm.
- dominant trees with full crowns produce the most seed.
- acorns require 18 months to mature.
- acorns remain viable on the ground for only one winter
- in light seed years, most acorns are lost to predation by birds and mammals or insect damage.
- ideal seedbed is moist mineral soil; germination is best when buried 2 cm in the soil
- red oak reproduces by stump sprouting: sprouts originating at root collar or below ground and seedling sprouts tend to develop less decay because of an independent root system

- red oak is a fire-adapted species; fire creates mineral soil exposure which enhances seed germination, and existing seedlings tend to resprout vigorously after fire.
- germination is followed by vigourous, rapid tap-root development
- red oak is intermediate in shade tolerance; seedlings cannot survive under a closed canopy
- once established seedlings require full light for survival and growth.
- in full sunlight red oak has faster height and diameter growth than most of its associates.
- dominant-codominant saplings and poles respond well to release; larger trees do not respond well to release.
- excessive release of suppressed stems often results in epicormic branches and top decline.
- red oak is deep rooted with a strong taproot and relatively resistant to windthrow.
- although relatively decay resistant, red oak is subject to a number of stem infections and leaf defoliators (forest tent caterpillar, LDD moth).
- oak seedlings may be repeatedly browsed by deer, causing re-sprouting and poor form.
- dieback and mortality due to drought stress in common on dry sites

The silvics of the other tree species of the oak forest type are detailed in Silviculture Guides produced by the OMNR.

LONG-TERM MANAGEMENT OBJECTIVE

Oak is a high value hardwood which is sought after for sawlog production, comparing well with sugar maple for value over the long-term and providing an important diversity of forest products to market. Periodic changes in consumer preference create a shift in demand between grained (oak, ash) and non-grained (maple, birch) hardwood lumber which typically follows a 10 to 20 year cycle. White oak is also a specialty product used for wine and whisky barrels. Oak fuelwood is typically less preferred species than most other high-density hardwoods. Although it provides good heat value, oak takes longer to dry for firewood than most other tree species.

The rate of volume growth on most oak sites is low to moderate but high yields from shelterwood harvesting and high average value per board foot can be achieved. Shaw Lumber Company tracked the volume production from three shelterwood cuts of a high quality oak stand on crown land in

Lanark County. Over a 12 year period from 1992 to 2004, the company harvested 5,120 board feet per acre from this stand (J. Shaw, personal communication, 2007). A typical tolerant hardwood selection cut generates 1,000 to 1,500 board feet per acre.

Because of its predominance on the landscape, oak is a critically important mast (food) species to maintain and regenerate. Acorns provide food for a diversity of wildlife and along with the hickory species are increasing in importance as beech declines due to beech bark disease.

Where oak is a minor component of tolerant hardwood forests, group selection is used to provide regeneration of the species. For oak-dominated stands, the long-term objective is to maintain and regenerate even-aged oak–white pine–hemlock forests.

MANAGEMENT

High quality oak–dominated forests are managed using a two or three cut shelterwood system. Table 11 summarizes the key parameters for oak management used on the Forest. Detailed guidelines for shelterwood management are provided in the Silviculture Guides produced by the OMNR. Group selection may be used where tolerant hardwoods are clearly dominant on the site and the objective is to maintain an oak component.

Table 11: Silviculture Summary of Red Oak Three Cut Shelterwood

	Seed Cut	Release Cut	Final Cut
Timing	**Age 80 to 120**	**5 to 15 years after seed cut**	**5 to 15 years after release cut**
Post-harvest Crown Closure	**70%**	**40-50%**	**< 10%**
Height of Oak Regeneration	**NA**	**.3 – 1.5m**	**.75 to 2.0m**
Harvest Season	**NA**	**Winter**	**Winter**
Post-harvest Tending (as required)*	**Manual or Prescribed Burn**	**Manual or Prescribed Burn**	**Manual or Prescribed Burn**
*** Manual tending should be applied immediately after sufficient numbers of seedlings are established. For best response from prescribed burning, seedlings should be 3 years old.**			

3.4.3 HARDWOOD SHELTERWOOD

Hardwood shelterwood is a moderate-sized hardwood forest type comprising 1522 hectares and 15.4 percent of the total forested area. These stands have been heavily disturbed in the past, either by heavy cutting or grazing and are generally of low quality and stocking. They contain a diversity of tree species including sugar and red maple, red oak, poplar, white birch and white pine. Two distinct ecotypes are recognized; on deeper soils these stands were originally upland tolerant hardwoods, while on shallower soils they were oak–white pine–hemlock forests. While these forests have the long-term potential to develop into good quality stands, they currently have high percentages of poor quality stems, intolerant hardwood species (poplar, white birch) and/ or ironwood.

The majority of these stands are in the 61 to 80 and 81 to 100 age classes. Most hardwood shelterwood forests are even-aged, but wind and ice storm damage can create two-aged forests. Forests with a history of grazing also tend to be two-aged, consisting of scattered defective hardwood stems with an understory of ironwood saplings and poles.

LONG TERM MANAGEMENT OBJECTIVE

The objective of management in this forest type is to enhance existing succession processes towards upland tolerant hardwood or oak–white pine–hemlock forests by favouring tree species suited to the site. Usually this means upland tolerant hardwoods on deeper soiled ecotypes and oak–white pine–hemlock on shallow or sandy soiled ecotypes.

MANAGEMENT

In most stands, commercial thinning is the most suitable treatment. Low quality and declining trees are removed to favour the growth and regeneration of tree species suited to the site condition. Depending upon the species, density and condition, basal area is typically reduced to 16 to 20 M2/ Ha, with a crown closure of 65 to 75%. For stands with the objective of conversion to upland tolerant hardwoods, group openings can be created to enhance the establishment and growth of

tolerant and mid-tolerant tree species. If the oak–white pine–hemlock type is the objective, a uniform canopy closure is desired to avoid encouraging tolerant hardwood regeneration, and large crown openings are generally avoided. Detailed guidelines for commercial thinning are provided in the Silviculture Guides produced by the OMNR

In low quality mature stands, a two cut shelterwood harvest may be used to release the advanced growth of hardwood regeneration and start a new forest. Periodically, planting of white pine or red oak is prescribed to supplement natural hardwood regeneration.

3.4.4 LOWLAND HARDWOODS

Lowland hardwood forest associations have a scattered distribution throughout the QC Forest, covering 525 hectares, or 5.3 percent of its total forested area. Stands occur in seasonally flooded areas along creeks and in the poorly drained areas of many properties. Larger expanses are found on limestone-based soil types in the southern part of the watershed. Lowland hardwood forests are dominated by the mid-tolerant tree species red and/ or silver maple (soft maples) and green and black ash growing on imperfect to poorly drained soils. Fresh to moist sites typically support a diverse group of tree species including white elm, bur oak, basswood, white cedar, largetooth aspen and balsam poplar. Hemlock and white pine are typically found on less disturbed sites. The wettest sites are treed swamps with few tree species, often limited to red and silver maple, white elm, black ash, tamarack and black willow.

Many lowland hardwood forests, particularly those on limestone-based soils have their origin in agricultural use, either as pasture or as hay fields. As these sites were abandoned due to drainage problems, pioneering mid-tolerant tree species became established. Cycles in beaver populations and the resulting fluctuations in water levels also contribute to the establishment and demise of lowland hardwood forests.

Higher quality stands have an abundance of single stems which have arisen from seed rather than coppice and higher stocking. Lower quality stands tend to be dominated by coppice growth, or are of lower stocking. Past clearcutting tends to increase the amount of coppice growth.

Most of the existing mid-tolerant species can successfully regenerate on the variety of microsites found within these forests. Green ash, white elm and white pine become established on soil hummocks, while yellow birch and hemlock favour rotting wood as a substrate. Silver maple is often found regenerating within seasonally flooded woodland pools. Small mammals and songbirds transport bur oak acorns which become established under the canopy of mature mixed lowland hardwoods. Red maple is a prolific seed producer that regenerates on most microsites.

Insects and disease have had a particularly significant impact on this forest type. White elm was present in much higher amounts prior to the introduction of dutch elm disease in the 1950s. Large elm trees are now rare, but elm typically survives to seed-bearing age before succumbing to the disease, allowing for the establishment of regeneration. The emerald ash borer (EAB) has also resulted in significant decline in the canopies of lowland hardwood forests. Few ash trees survive the infestation, although at this time ash regeneration is still plentiful. Where invasive species like glossy buckthorn have become established these shrubs may completely dominate the understory of lowland hardwood stands after ash and elm mortality to the detriment of native tree species.

The majority of the forests are in the 61 to 80 and 81 to 100 age classes. Most lowland hardwood forests less than 60 years of age are even-aged. Older stands may develop a two aged or all-aged distribution.

SILVICS OF SILVER MAPLE (From OMNR 1998a, OMNR 2000, McDonald 2003 and local knowledge)

Silver Maple
- silver maple is a prolific, regular seed producer.
- seedlings can germinate in a wide variety of seedbeds and are tolerant of limited seasonal flooding in woodland pools.
- spring seed dispersal and germination allows silver maple to take advantage of increased area of suitable microsites in swamps during prolonged droughts.
- seedlings are highly intolerant of competing vegetation and will only survive for one to two years under dense shade.

- while silver maple is well known for its prolific sprouting ability, single stems from seedlings are more desirable for producing quality timber.
- silver maple is moderately shade tolerant to intolerant, depending upon site quality.
- vigourous polewood and small logs with healthy crowns have been shown to respond well to thinning.
- release of suppressed stems often results in the development of epicormic branches.
- major damaging agents include the Columbian timber beetle (wood quality degrade), windthrow on wet soils, ice and snow damage, internal rot which enters through broken branches or decaying stems of coppice clumps and deer browsing on seedlings.
- silver and red maple are known to hybridize in nature.

The silvics of the other tree species of the lowland hardwood forest unit are detailed in Silviculture Guides produced by the OMNR.

LONG-TERM MANAGEMENT OBJECTIVE

While lowland hardwood species such as soft maple, ash and bur oak are of moderate value as sawlogs, the high rate of volume growth on these sites makes sawlog production a sound financial objective. Yields of 1200 to 1500 board feet per acre of sawlogs are typical from light selection thinning of mature mixed lowland soft maple-ash-elm forests. Thinning of mixed lowland hardwood stands is recommended to reduce the percentage of green ash and encourage other species regeneration prior to EAB infestation (Streit et al, 2012).

MANAGEMENT

Management knowledge of poorly drained hardwood swamps is limited, although light thinning of younger stands has been shown to have excellent growth response. Larger scale cutting has typically been approached with caution by forest managers because of the potential for wholesale changes in the water table and subsequent flooding and potential for windthrow of shallow rooted tree species. Partial cutting is also critical in controlling the dense shrub and herb competition present on some rich lowland sites.

Management of lowland hardwoods focuses on the better drained fresh to moist sites using the single tree or group selection system. The long-term management objectives for these sites are:

- maintain a continuous forest canopy,
- reduce the percentage of green ash,
- develop or maintain an all-aged forest condition,
- improve the overall timber quality of the stands, with particular emphasis on growing single stems rather than coppice clumps,
- enhance/ restore the components of large trees, white pine and hemlock,
- maintain/ regenerate a diversity of mid-tolerant tree species
- maintain/ regenerate a component of minor tree species
- provide protection for significant wildlife habitat and wildlife trees

Table 12 summarizes the key parameters for selection management in lowland hardwoods.

Table 12: Silviculture Summary Lowland Mixed Hardwoods

Full stocking basal area		30 to 38 m2/ ha			
Desired residual basal area		20 to 26 m2/ ha			
Full stocking crown closure		75-90%			
Desired residual crown closure		60-70%			
Desired Structure	DBH cm	10-24	26-36	38-48	50+
	BA m2/ ha	5	6	6	5 - 7
Cutting cycle		15 to 20 years			
Group openings		1 to 2 per hectare, ½ to full tree height			

Detailed guidelines for lowland hardwood management are provided in the Southern Ontario Silviculture Guide produced by the OMNR.

3.4.5 EARLY SUCCESSIONAL (INTOLERANT) HARDWOODS

At 400 hectares and 4.1 percent of total forested area, intolerant hardwoods represent the smallest hardwood forest type on the QC Forest. These forests typically developed after heavy disturbance prior to ownership by the CA. Past disturbances may include past high-grading, clearcutting, agricultural land clearing or cattle grazing. Three ecotypes can occur, depending upon potential future forest and soil types; upland tolerant hardwoods on deeper soils, oak or white pine on shallow or sandy soils, and soft maple-ash or cedar-white spruce on lowland soils.

The pioneer tree species poplar and white birch make up at least 30% of the composition of these forests. Trembling and largetooth aspen dominate the better drained sites, with balsam poplar occurring on imperfectly to poorly drained soils. Eastern cottonwood can also occur as a minor component. Common associates on upland sites include sugar and red maple, balsam fir, white pine and red oak, depending upon soil depth. White cedar, green ash and red maple are found on moister sites. Most tree species can be found within this forest type. Stand stocking and quality of these stands is frequently low.

The forests are transitory by nature and may contain a well-stocked understory of good quality saplings and polewood mid-tolerant and shade tolerant tree species. Regeneration is usually dominated by sugar maple and balsam fir, although most other tree species can be found in the understory if seed source is available.

The majority of these stands are in the 61 to 80 and 81 to 100 year age classes.

SILVICS

The silvics of the tree species of the intolerant hardwood forest type are detailed in Silviculture Guides produced by the OMNR.

LONG TERM MANAGEMENT OBJECTIVE

The objective of management in this forest type is to enhance existing succession processes to restore tree species suited to the site and to develop more mature forests. Usually this means upland tolerant hardwoods on deeper soils, oak or white pine on shallow or sandy soils, and soft maple-ash-elm or cedar-white spruce-tamarack on lowland soils.

MANAGEMENT

In stands with a substantial component of desirable tree species with good quality, commercial thinning is the most suitable treatment. Low quality and declining trees are removed to favour the growth and regeneration of tree species suited to the site condition. Depending upon the species, density and condition, basal area is typically reduced to 16 to 20 M2/ Ha, with a crown closure of 65 to 75%. For stands with the objective of conversion to upland tolerant hardwoods, group openings can be created to enhance the establishment and growth of tolerant and mid-tolerant tree species. If white pine, oak, white cedar or white spruce are the objectives, a uniform canopy closure is desired to avoid encouraging tolerant hardwood regeneration, and large crown openings are generally avoided. Detailed guidelines for commercial thinning are provided in the Silviculture Guides produced by the OMNR

In mature stands dominated by poplar and birch and/or desirable species with poor quality, shelterwood management can be used to release the advanced growth of hardwood regeneration. Where poplar or white birch regeneration is desirable, clearcutting with seed trees is the preferred system. Periodically, tree planting used to supplement hardwood regeneration.

3.4.6 WHITE CEDAR

White cedar is a significant conifer forest type on the QC Forest consisting of 646 hectares and 6.6 percent of the total forested area. The forest is dominated by white cedar although white spruce, tamarack, and balsam fir are also important. Common hardwood associates include poplar, white birch, green and black ash, sugar and red maple, basswood and white elm. Trembling and largetooth aspen occur on the better drained sites, with balsam poplar occurring on imperfectly to poorly drained soils. The forest type is characterized by two distinct ecotypes: upland and lowland white cedar.

Upland white cedar forests typically developed after the clearing of nutrient poor soils for agriculture purposes, which was followed by land abandonment and reclamation by a mix of pioneer conifer and hardwood tree species. Hard maple, green ash, white elm, basswood and other upland hardwoods can form a component of upland cedar stands. They are transitory by nature and may contain a well-stocked understory of good quality mid-tolerant and shade tolerant tree species. Regeneration is usually dominated by sugar maple or green ash, although most other hardwood species can be found in the understory if seed source is available. Substantial quantities of aspen suckers can developed after crown openings are created, either through logging or storm damage.

Lowland white cedar forests are typically a late successional tree species association, although some lowland cedar sites developed after farm fields were abandoned. Few tree species besides white cedar, black ash, red and silver maple, yellow birch, white spruce, balsam fir, balsam poplar and tamarack can survive in these wet, nutrient poor sites. Most trees are small, but larger specimens may be found along the boundaries with upland sites. Black ash and balsam fir tend to be the most common tree species regenerating in the understory of lowland cedar stands.

Cedar stands typically range from 61 to 120 years of age. Cedar-dominated forests comprise the largest area of conifer forest types greater than 100 years of age. Most upland white cedar forests are even-aged, but storm damage can create two-aged forests by causing severe breakage of cedar. Older lowland forests may develop an uneven-aged structure.

SILVICS OF WHITE CEDAR (From OMNR 1996, OMNR 1998b, and local knowledge)

- cedar grows on a range of soil and site conditions and can tolerate a wide range in soil moisture
- seed production begins around age 30 but is best after 75 years
- seed crops occur every 2-5 years, seed is primarily disseminated by wind and by red squirrels
- favourable seedbeds include mixed mineral soil and humus and decaying stumps and trees
- ample soil moisture is critical to seed germination and early seedling survival
- cedar seedlings grow slowly, and hardwood leaf litter may smother young seedlings
- seedling height growth reaches a maximum at approximately 50 per cent full sunlight
- vegetative reproduction is common in swamps: buried cedar branches can send out roots if moisture conditions are favourable (layering)
- layered regeneration is more shade tolerant than seedlings
- browsing by white tailed deer, rodents, snowshoe hares and moose are all limiting factors for cedar regeneration
- white cedar is a slow growing, shade tolerant, long-lived pioneer species
- the growth rate of cedar is about three times faster on upland than lowland sites
- cedar responds well to release throughout its life but response to thinning is site dependent.
- cedar are known to be one of the longest living trees in Ontario. Individuals greater than 1000 years of age have been found growing on cliffs on the Niagara escarpment.
- in lowland sites rooting is shallow and windthrow is common
- changes in water levels due to beavers and construction may kill entire lowland cedar stands
- due to its dense foliage and brittle wood cedar is subject to breakage from snow and ice
- cedar is highly susceptible to fire damage due to its thin bark and high oil content. Even-aged lowland white cedar stands can originate after high intensity fires during severe drought years

The silvics of the tree species of the other conifers forest type are detailed in Silviculture Guides produced by the OMNR.

LONG-TERM MANAGEMENT OBJECTIVE

White cedar has the potential for producing a range of forest products. Larger trees can produce sawlogs, while smaller trees are used for posts and pickets. Cedar is well known for its rot

resistance. However, many of these forests have limited merchantable volume due to age and quality, and wet sites and ice damage create further operability limitations.

Regeneration objectives in upland cedar stands are to manage succession towards upland hardwoods, while maintaining a component of conifer patches for wildlife cover. On lowland sites, maintenance of conifer cover is a high priority.

MANAGEMENT

When stands are encountered with sufficient volume to warrant a harvest cut and site conditions which permit operations, even-aged thinning of younger stands and patch-clearcutting of older stands will be applied. Detailed guidelines for conifer management are provided in the Southern Ontario Silviculture Guide produced by the OMNR.

3.4.7 WHITE PINE

White pine comprises 1265 hectares (12.8 percent) of the total forested area. White pine forests occur naturally on sandy and shallow rocky soils, and white pine natural regeneration is also common under shallow-soiled red oak stands and red pine plantations. White pine has also been under-planted in a number of red pine plantations. Under-planting provides shade to minimize the impacts of the white pine weevil. There are a few white pine plantations that were established on old fields on the QC Forest.

SILVICS OF WHITE PINE (From OMNR 1998b and local knowledge)

- White pine grows under a wide variety of soil and moisture conditions. While typically associated with well-drained sandy or shallow soils, large white pine can also be found growing on hummocks in swamps.
- Although cone production can begin as early as 15 years of age, optimal seed crops occur after 50 years.

- Moist mineral soil, mineral soil and humus mixtures and moist organic seedbeds are suitable for germination.
- White pine seedlings can establish under 20 to 25% of full sunlight.
- White pine is intermediate in shade tolerance: leader growth increases with light intensity up to approximately 45 to 55 per cent of full sunlight.
- Young white pine seedlings are slow growing for their first five years and are adversely affected by competition from understory brush and hardwood species.
- White pine response to release is best if the tree is not overly suppressed and has at least a 1/3 live crown ratio.
- Individual tree crown dominance is moderately expressed in white pine plantations, resulting in self-thinning and subsequent mortality of suppressed trees.
- White pine is usually a deep rooted species which is relatively windfirm.
- The most common damaging agents of white pine are white pine weevil, white pine blister rust and ice and snow damage.

LONG-TERM MANAGEMENT OBJECTIVE

White pine is used to produce lumber used for furniture, cabinets and mouldings, boltwood and as a minor component of the furnish for fine papers. Demand for open-grown white pine is limited by the quality problems associated with white pine weevil and blister rust.

The long-term management objective is to regenerate even-aged white pine forests and enhance white pine that is developing under oak and red pine forests, although regeneration of a variety of associated species (red pine, white spruce, hard and soft maple, ash, elm, beech, cherry) is also expected. White pine growing on shallow rocky, soils is generally not harvested, although it may be managed to retain as an all-aged forest with patches of white pine of a variety of ages.

MANAGEMENT

The primary limitation on commercial first thinnings in white pine is short merchantable height because of white pine weevil damage and/ or site limitations. Where average merchantable height

exceeds 8 meters, first thinnings can be carried out when the stand reaches an average diameter of 20 centimeters and a basal area of 35 M2/ Ha. This is usually reached when natural stands are 45 to 50 years of age. Thinnings are selective, although enough trees must be marked to permit machine access. Basal area stocking guides for thinning white pine stands are provided in Tables 13 and 14 on the following page. For a particular stand, the prescription for residual basal area should typically fall between the Stand Density Index (SDI) target and a 1/3 basal area removal. The associated stand density index diagram is found in Appendix 4.

Two sources have been used for basal area stocking guides for white pine. At average diameters of 25 cm (10 inches) and up, the OMNR targets (Table 13) have been field assessed and are appropriate. For stands with average dbh of less than 25 cm, OMNR guidelines for residual basal area suggest thinning white pine plantations to a level that is lower than recommended by local managers. For these younger stands, thinning guidelines will also consider the more conservative targets as provided by the USDA (Table 14). A residual basal of 26 m2/ ha (115 ft/ acre) is considered a minimum for a first thinning in any commercial white pine stand.

Live crown ratio is usually 30 to 50% at the time of first thinning. While some self-pruning will occur, most white pine forests on better sites should be pruned to increase the lumber yield and to reduce the incidence of blister rust infections.

HARVEST CUTS

Harvest cuts differ from thinning operations in that management is primarily focused on the biological needs of the regeneration, rather than the mature trees. Harvest cuts will be scheduled in mature white pine forests with the potential to develop regeneration of pine and/or oak.

Harvest cuts in white pine will be consistent with OMNR Silviculture Guidelines. Typically, a three-cut uniform shelterwood system (seeding, release and final removal cuts) is planned. Deferral of the final removal cut may be considered to preserve aesthetic values. Natural white pine, red pine and red and white oak regeneration is preferred, but under-planting may be used to supplement natural regeneration. Manual or chemical tending will be scheduled as required.

Table 13: White Pine Plantations (25 cm and up average diameter) Source: OMNR (1997)

DBH		SDI Fully Stocked		SDI Target Residual BA			Minimum Residual BA (33% Removal)	
Cm	Inches	M2/ Ha	Ft2/ Acre	M2/ Ha	Ft2/ Acre	% Removal	M2/ Ha	Ft2/ acre
15	6	24.7	108	18.5	81	25%	16.5	72
17.5	7	27.6	120	20.4	89	26%	18.4	80
20	8	30.8	134	22.6	98	27%	20.5	89
22.5	9	33.0	144	23.8	104	28%	22.0	96
25	10	35.6	155	25.8	112	28%	23.7	103
27.5	11	37.4	163	27.6	120	26%	24.9	109
30	12	40.6	177	29.0	126	29%	27.0	118
35	14	44.2	193	31.7	138	28%	29.4	128
40	16	47.7	208	35.2	153	26%	31.8	138
45	18	50.9	222	37.4	163	27%	33.9	148

Table 14: White Pine (Less than 22.5 cm average diameter) Source: Wisconsin Extension (1996)

DBH		Fully Stocked		Target Residual BA			Minimum Residual BA (33% Removal)	
Cm	Inches	M2/ Ha	Ft2/ Acre	M2/ Ha	Ft2/ Acre	% Removal	M2/ Ha	Ft2/ acre
15.2	6	33.3	145	20.9	91	37%	22.2	97
17.8	7	35.6	155	24.1	105	32%	23.7	103
20.3	8	39.0	170	27.9	121	29%	26.0	113
22.9	9	41.3	180	29.0	126	30%	27.5	120
25.4	10	43.6	190	32.1	140	26%	29.0	127
30.5	12	48.2	210	36.4	159	24%	32.1	140
35.6	14	50.5	220	38.7	169	23%	33.6	147
40.6	16	52.8	230	39.8	174	25%	35.2	153
45.7	18	55.1	240	42.2	184	23%	36.7	160

3.4.8 RED PINE (PLANTATIONS)

There are 473 hectares of red pine plantations on the QC Forest and these are the dominant forest type in the Commercial Forest. This is only 4.8 percent of the total forested area. Most are in the 41 to 60 and 61 to 80 year age classes. Red pine plantations have been planted on two soil types in the QC Forest which creates two ecotypes:

1) Well drained sand or gravel soils, and
2) Sandy loam-rock complexes.

Red pine plantations are typically pure red pine although small pockets of white spruce or white pine were sometimes planted on lower slopes. Red pine plantations often contain hardwood trees which were located in farm fencerows or regenerated at the time of establishment including cedar, poplar, sugar maple, elm, and black cherry. This diversity helps to enhance the wildlife habitat values in young single-species plantations. Most plantations have received several thinnings.

Regeneration is sparse in young, well-stocked red pine plantations but white pine, mixed hardwood (sugar maple-oak-ash-cherry-elm) and balsam fir regeneration develop quickly after stands have undergone thinning.

SILVICS OF RED PINE (From OMNR 1998b and local knowledge)

- Red pine typically grows on dry, sandy, acidic sites with low fertility.
- Red pine planted on calcareous soils typically start dying back after 30 years.
- Cone production begins at 15 to 25 years of age for open grown red pine and 50 to 60 years for red pine in closed stands.
- The infrequency and irregularity of red pine seed crops are limiting factors affecting natural red pine regeneration.
- Moist mineral soil or mineral soil with a sparse covering of organic materials and partial shade provide conditions suitable for germination.
- Red pine seedlings require at least 35% of full sunlight for successful establishment.

- Shade tolerance of red pine seedlings deceases with age: maximum seedling height growth will occur at 45 per cent of full sunlight until 5 years of age, but older seedlings prefer 65 to 100% of full sunlight.
- Red pine seedlings are adversely affected by competition from understory brush and hardwood species.
- Red pine response to release is best if the tree is not overly suppressed and has at least a 1/3 live crown ratio.
- Individual tree crown dominance is poorly expressed in red pine plantations, resulting in stagnation of dense stands.
- Red pine is usually a deep rooted species which is relatively windfirm.
- The most common damaging agents of red pine are ice and snow damage and root rots.

LONG-TERM MANAGEMENT OBJECTIVE

Red pine is a used to produce poles, sawlogs and boltwood and as a minor component of the furnish for fine papers. Demand for plantation red pine thinnings significantly increased in the mid 1990s with the development of boltwood markets, resulting in high stumpage values.

The long-term management objective for red pine plantations is to regenerate mixed pine forests (primarily white pine and oak) on sand and gravel ecotypes and hardwood forests (sugar maple, oak, basswood ash, elm, cherry) forests on sandy loam ecotypes.

MANAGEMENT

First thinnings in red pine can be carried out when the stand reaches an average diameter of 18 centimeters and a basal area of 40 M2/ Ha. This is usually reached once plantations reach 25 years of age.

Typically first thinning is a row thinning removing every fourth to fifth row to establish access, with selection thinning within the remaining rows. Many older plantations have had every 3rd row removed during the first thinning. Full row removal is preferred. Jogs in the row to avoid areas of

high quality timber are acceptable provided they are limited; repeated short jogs in rows create problems for machine operators and may reduce the ability to market the thinnings.

Subsequent thinnings are selective, using the previously harvested rows for access. Basal area stocking guides for thinning red pine plantations are provided in Table 15. For a particular stand, the prescription for residual basal area should typically fall between the SDI target and a 1/3 basal area removal. The associated stand density index diagram is found in Appendix 4.

Table 15: Red Pine Plantations Source: OMNR (1997)

DBH		SDI Fully Stocked		SDI Target Residual BA			Minimum Residual BA (33% Removal)	
Cm	Inches	M2/ Ha	Ft2/ Acre	M2/ Ha	Ft2/ Acre	% Removal	M2/ Ha	Ft2/ acre
15	6	37.1	162	28.3	123	24%	24.7	108
17.5	7	38.5	168	30.1	131	22%	25.6	112
20	8	40.8	178	31.4	137	23%	27.2	118
22.5	9	42.1	183	31.8	139	24%	28.0	122
25	10	44.2	193	33.4	145	24%	29.4	128
27.5	11	44.5	194	34.4	150	23%	29.6	129
30	12	45.9	200	34.6	151	25%	30.6	133
35	14	47.1	205	36.5	159	23%	31.4	137
40	16	48.4	211	37.7	164	22%	32.2	140

Source: OMNR 1997.

Live crown ratio is usually 25 to 40% at the time of first thinning. Red pine has excellent self-pruning properties in well-stocked stands.

HARVEST CUTS

Harvest cuts differ from thinning operations in that management is primarily focused on the biological needs of the regeneration, rather than the mature trees. On sand and gravel ecotypes regeneration of white pine and oak is the desired objective. Shelterwood harvest cuts will be scheduled on these sites in mature red pine plantations, or in younger stands with dense advanced regeneration of white pine and/ or oak. Natural regeneration is preferred, but under-planting may

be used to supplement natural regeneration. Manual or chemical tending will be scheduled as required. Shelterwood harvest cuts in red pine plantations will be consistent with OMNR Silviculture Guidelines. Typically, a three-cut uniform shelterwood system (seeding, release and final removal cuts) is planned. Deferral of the final removal cut may be considered to preserve aesthetic values.

On sandy loam ecotypes a dense understory of hardwood regeneration develops after the first thinning and is enhanced with each subsequent operation. Continuous thinnings in these plantations will eventually result in an all-aged tolerant hardwood forest, with a minor component of white pine, red pine and oak. These stands will eventually be managed as tolerant hardwoods under the selection system; shelterwood harvest cuts will not be scheduled under these conditions.

MF – 128 POTTER SETTLEMENT STRUCTURAL DIVERSITY ENHANCEMENT DEMONSTRATION SITE

Compartment #: 21 & 22

Part Lot 18, Con 14 Geographic Township of Hungerford, Hastings County.

The red pine plantations in this area have been identified as a demonstration site for 'structural diversity enhancement techniques' (or S.D.E. after Keeton, 2006) utilizing a continuous cover irregular shelterwood system (after Raymond et. al., 2009).

With its frontage on Bridgewater Road, compartment 21 appears to have been intended for demonstration purposes from the beginning. Interestingly, the mix of planted conifer trees includes Red Pine, White Pine, and Red Spruce. The closest documented population of Red Spruce (Picea rubens) is on a Crown land block, found just north of Bon Echo Provincial Park (near Stoll Lake). Several aluminum tags & blue paint were discovered in the north-western portion of the compartment during inventory work. Although all records have been apparently lost, it appears that the Red Spruce was either transplanted or seed was purposefully grown in order to establish a new population (Gordon, 1957). There are now many well-established Red Spruce saplings within the understory of the adjacent compartment 22; which was originally established as a pure Red Pine plantation.

The main purpose of implementing a S.D.E. technique is demonstration to the interested public and protection of the advanced Red Spruce regeneration found on site. By implementing an S.D.E. harvest technique, the stand will be accelerated into providing old-growth structural diversity characteristics while maintaining a longer than the average stand rotation for Red Pine (Raymond et. al., 2009). To achieve this goal, the stand is being managed under a shelterwood system with at least two anticipated forest operations (2020 and 2025) conducted under frozen ground conditions. The first operation (2020) focused on creating standing dead trees, coarse woody material, and pit/ mound structure. A second, similar harvest regime has been scheduled for the winter of 2025; creating multiple ages of decaying material. A few vigorous red pine specimen trees will be selected in order to maintain 'veterans' allowed to achieve their maximum lifespan and maintain super canopy structure in the stand.

3.4.9 HEMLOCK

Hemlock is a small forest type but one of the most ecologically significant tree species growing on the QC Forest and is often an indicator of forests with relatively low levels of disturbance. It currently occupies 113 hectares, but is likely more significant as hemlock understories are often missed by FRI. In agricultural areas hemlock was commonly harvested during early settlement and used for farm buildings because of its rot resistance. The bark of hemlock was an important source of tannin for the leather tanning industry. When poor quality farmlands are abandoned hardwoods, cedar, white spruce and white pine are usually the first pioneer species to invade. Hemlock, which is adapted to higher levels of shade, is very slow to recolonize these sites.

On the Canadian Shield hemlock is common as a minor component of tolerant hardwood and white pine stands, and in relatively pure stands where the species was bypassed by loggers harvesting more desirable species like white pine. Hemlock also can form even-aged stands with white pine and red oak that have regenerated after fire.

Red spruce is an uncommon species that can occur in hemlock stands on the Canadian Shield. Surpassing hemlock in its tolerance of shade, patches of red spruce and hemlock regeneration can be found in very small canopy gaps.

SILVICS OF HEMLOCK (From OMNR 1998b, OMNR 1990 and local knowledge)

- seed production begins around age 40 but older when shaded, and suppressed trees rarely fruit
- hemlock seed crops occur every 2-3 years and can disperse up to 1 km on snow crust
- germination is best on cool, moist shaded sites, hemlock stands are often found on north slopes
- favourable seedbeds include mixed mineral soil and humus and decaying stumps and trees
- hemlock does not regenerate well on undisturbed litter in hardwood stands, but can regenerate on pit and mound tip-ups in these situations
- hemlocks are shallow rooted and suffer from exposure caused by excessive release; however, they are generally windfirm except on shallow or very wet soils.
- hemlock is extremely shade tolerant: it can germinate in as little as 5% of full sunlight and can survive in 20% of full sunlight
- hemlock responds well to release: seedlings can respond with increased growth after overhead release, and larger stems respond well to release, particularly if live crown ratio (LCR) is > 50%
- excessive release of suppressed stems often results in crown dieback
- Hemlock occurs as both even and uneven-aged stands, and can attain very high stocking levels (> 50 m2/ Ha) in fully stocked stands
- hemlock trees are generally slow growing and can live to over 400 years of age
- hemlock provides important winter cover for white-tailed deer and moose, but ironically their browsing on seedlings can severely limit hemlock regeneration.

The silvics of the other tree species of the hemlock forest type are detailed in Silviculture Guides produced by the OMNR.

LONG-TERM MANAGEMENT OBJECTIVE

On the QC Forest stands with > 30% hemlock have generally been reserved from harvesting due to ecological value. However light thinning of hemlock stands has recently been recommended to increase the resilience of residual hemlock to the invasive pest hemlock wooly adelgid (HWA) infestation and to reduce the desired light conditions for HWA populations (Parker et al, 2023).

MANAGEMENT

Crown thinning guidelines for hemlock are as follows (Elliott, 2024):

- light thinning from below targeting the removal of suppressed, poor health/quality trees, while increasing light on hemlock crowns and improving growth of residual dominant and co-dominant hemlock stems
- Target crown closure is 70% (but not below)
- hemlock with < 30% LCR should be removed
- most other species will be retained to maintain diversity and forest cover but UGS stems can be cut to achieve crown closure and hemlock release objectives
- residual basal area targets are:
    - 2/3rds to 3/4s (66% to 75%) of the starting BA should be retained
    - minimum residual basal area should not be below 24 m2/ha

Where forest management is recommended, both single tree selection and a three-cut uniform shelterwood system are acceptable silviculture systems. Both systems involve the use of high residual stocking levels to reduce the impacts of over exposure. For the selection system basal area reductions are typically 25 to 33%, with residual basal areas of 24 – 34 m2/ ha. Shelterwood regeneration cuts retain crown closures of 70 to 80%. Hemlock regeneration is unlikely to be successful in areas of high deer and moose populations.

3.4.10 OTHER CONIFERS (RED CEDAR, SPRUCE, BALSAM FIR, TAMARACK, LARCH, JACK PINE)

This forest type includes several unique species and comprises 726 hectares, or 7.4 percent of the total forested area. Only the spruce and larch plantations are considered for active management:

1) Red cedar stands that have developed on depleted agricultural soils
2) Mixed conifer stands of spruce, balsam fir and tamarack
3) White spruce, norway spruce or larch plantations
4) Jack pine plantations These plantations are typically small and are usually planted on shallow soils over bedrock. By providing initial forest cover, they act as a nurse crop for hardwood and white pine regeneration. Most jack pine plantations are of very poor form and quality. Jack pine is considered as a transition species that is growing outside its natural range and there are currently no plans to harvest or regenerate this species. Jack pine stands are naturally succeeding to hardwood forests, a process which has been accelerated by wind storms.

SILVICS

The silvics of the tree species of the other conifers forest type are detailed in Silviculture Guides produced by the OMNR.

LONG-TERM MANAGEMENT OBJECTIVE

Active forest management is generally a low priority for these forests. Most stands have limited merchantable volume and at best a few low – value sawlogs. Wet and/ or shallow soils create further operability limitations. The exception is spruce plantations, which may have sufficient size and quality to warrant thinning. White spruce is a used to produce commercial dimension lumber and newsprint. Demand for white spruce has increased as the supply has decreased from traditional sources both in Ontario and Quebec. The long-term management objective is to allow continued natural succession, although small areas of these forest types may be managed along with larger blocks of Commercial Forest.

3.4.11 TRENDS IN FOREST TYPE SUCCESSION

The CA's properties were private lands that were typically farmed or logged before being sold to the CA. As a result of significant past natural and man-made disturbances, many have been set back to earlier stages of forest succession. The forest management practiced by the CA, including fire suppression tends to result in relatively low levels of disturbance. As the forests develop, many will change composition drastically regardless of whether they are managed or not.

Tolerant hardwoods, hemlock, shallow-soiled oak sites, lowland hardwoods, lowland cedar and white pine are relatively stable ecosystems that are considered permanent forest types on the QC Forest. Hemlock and tolerant hardwood types are the most stable, and barring significant disturbance are likely to remain as "steady state". Oak on shallow soils and white pine, and lowland hardwoods and lowland cedar are also stable, although they may cycle back and forth.

Oak on deeper soils, hardwood shelterwood, intolerant hardwoods, upland cedar, other conifers and red pine are forest types in transition: in the absence of further major disturbances, over time they will succeed towards the permanent forest types.

Table 16 on the attached page summarizes the trends in forest type succession for the QC Forest. The column desired future forest condition indicates the potential long-term objectives for forest managers. For some forest types like white pine and red oak silviculture inputs including tree planting may sometimes be necessary to achieve the objectives.

A sub-sample of the permanent inventory plots established by Bluesource (Anew) will be remeasured at five-year intervals, with full project-level inventory at 10-year intervals for the 40-year duration of the project. This will provide Quinte CA with the unique opportunity to measure and assess long-term forest succession trends.

Table 16 Quinte Conservation Forest: Trends in Forest Type Succession*

FOREST TYPE	ECOTYPE	STABILITY	TREND	DESIRED FUTURE FOREST CONDITION
Tolerant Hardwoods (TH)	All	Permanent	Increase	TH, He
Oak (Oak)	Shallow Soil	Permanent	Stable	Oak, Pw
	Deep Soil	Transition	Decrease	TH
Hardwood Shelterwood (HDus)	Shallow Soil	Transition	Decrease	Oak, Pw
	Deep Soil	Transition	Decrease	TH
Early Successional (Intolerant) Hardwoods (Int)	Shallow Soil	Transition	Decrease	Oak, Pw
	Deep Soil	Transition	Decrease	TH, Int
	Wet Soil	Transition	Decrease	LH, Ce
Lowland Hardwoods (LH)	All	Permanent	Stable	LH, Ce
Hemlock (He)	All	Permanent	Stable	He, TH
White Cedar (Ce)	Upland	Transition	Decrease	TH, Ce
	Lowland	Permanent	Stable	Ce, LH
Other Conifers (OC)	Upland	Transition	Decrease	TH
	Lowland	Transition	Decrease	OC, Ce, LH
White Pine (Pw)	All	Permanent	Stable	Pw, Oak, TH
Red Pine (Pr)	Sand	Transition	Decrease	Pw, Oak, TH
	Sandy Loam	Transition	Decrease	TH

* Assumes continuation of current forestry practices and levels of natural disturbance

4.0 NATURAL AND CULTURAL HERITAGE VALUES OF THE QUINTE CONSERVATION FOREST

4.1 INTRODUCTION

The QC Forest boasts a diversity of natural and cultural heritage values. Some of these values are landscape level features such as wetlands, lakes, rivers, and deer wintering areas which have been classified and mapped by the Ministry of Natural Resources. Other point values such as raptor nests or remnants of old homesteads may be discovered by or reported to staff. New values are assessed for accuracy and appropriateness prior to addition to the inventory. Natural and cultural heritage values are an important part of the Forest's legacy and are given special consideration for protection when planning forestry operations.

4.2 VALUES INVENTORY AND MAPPING

Values information for the QC Forest is documented on the GIS system and Compartment Maps (Appendix 2). The initial information source is OMNR's Natural Resources and Values Information System (NRVIS). The maps provide the initial inventory for assessing the natural heritage and cultural values on a particular property.

Prior to forest harvesting, Quinte Conservation carries out natural heritage inventories for natural forest stands. New values information may be also discovered by staff or contractors during the course of forestry operations. Forestry workers are informed of the values and appropriate protections are put in to place to provide protection. Generally, as new values are discovered, maps will be updated or new maps created to reflect this information. However, new values which are highly sensitive or subject to exploitation are not mapped but are protected on-site.

4.3 WATER FEATURES

"Wetlands and riparian areas are among the most critical parts of any forest ecosystem… and are utilized by over 90% of the region's wildlife species and provide the preferred habitat for over 40% of these species (New Hampshire, 1997)." The water features of the QC forest are summarized in Table 17 at the end of Section 4.4.

4.3.1 WETLANDS

Wetlands provide wildlife habitat for numerous species, water filtration and purification, erosion and flood control and recreation opportunities. Wetlands are typically composed of varying percentages of swamp, fen, bog and marsh. There are 2,455 hectares of wetlands mapped on the QC Forest, representing 18.9 percent of the total area.

In Ontario, the significance of wetlands is determined by evaluating biological, social, hydrological and special features attributes. Although all wetlands are important ecosystems, provincially significant wetlands are those which rank the highest in the provincial wetland classification system at this time – they are subject to review. Many of the wetlands in the QC watershed have not been evaluated. This is not because they are less important, but rather because wetland evaluation in Ontario has typically been focused off of the Canadian Shield as these wetlands are under greater pressure of drainage and development. Of the total area of mapped wetlands in table 17, 828.2 ha are evaluated wetlands and 1626.8 ha are unevaluated wetlands greater than 4 hectares in size.

Openings created by beaver in forested landscapes provide critical habitat diversity on the Forest. The continuing cycle from forest, to flooded areas with standing dead trees, through stagnant ponds, to open meadows and back to forest again provides for a variety of wildlife. These include "frogs, turtles, waterfowl, great blue herons, swallows, otter, mink, and moose in the open water stage; to geese, grouse, woodcock, woodpeckers, yellow-throats, yellow warblers, bog lemmings, bear, deer and moose in the open meadow stage. (New Hampshire, 1997)." For early settlers, beaver meadows were critical pasture areas; periodically evidence of old cedar rail fences can still be found surrounding these natural grasslands.

"Vernal pools are small depressions that fill when spring melt-water or autumn rains accumulate, or when groundwater level rises above the level of the depression (New Hampshire, 1997)." These ponds cannot support fish but provide a unique breeding and feeding habitat for frogs, salamanders, insects and other invertebrates. These features are usually too small and numerous to be mapped, but are given protection during tree marking and harvesting operations.

4.3.2 LAKES AND RIVERS

In addition to the values provided by wetlands, lakes and rivers also provide important fish habitat. There are several lakes on or adjacent to the Quinte Conservation Forest properties: Deerock Lake, Lingham Lake, Haley and Mellon Lake, Moira Lake, Sampson Lake, Second and Third Depot Lakes, Bitch and Dog Lakes, Fifth Lake, Hambly Lake, Varty Lake, and frontage on the Bay of Quinte and Lake Ontario. Additionally, the properties front onto portions of the Black River, Skootamatta River, Clare River, Moira River, Salmon River and Napanee Rivers. Lastly, frontage on several creeks also exist, including the Potter, Deer, Elzevir, Parks, Goose, Chrysal, Number 10, Palliser, Bloomfield, Demorestville, Depot, Carman, and Dead Creek systems.

In addition to these permanent classified water bodies, there are numerous seasonal (intermittent) creeks on the QC Forest. These sites often green-up early in the spring, and as a result are frequently visited by many wildlife species. They are areas of high diversity for plant species, and are given special protection to minimize disturbance from logging operations.

4.3.3 WATERFOWL STAGING AREAS

In the fall, many ducks vacate smaller wetlands used during the breeding season and congregate with other waterfowl on larger marshes and lakes. Wetlands provide critical roosting sites. Priority staging areas are also adjacent to preferred feeding areas as waterfowl have to consume large quantities of food in preparation for the fall migration. The coastal wetlands of Lake Ontario in the Bay of Quinte and western Prince Edward County are significant for waterfowl staging and nesting. Forest management guidelines will follow the area of concern prescriptions for wetlands,

although a specific season of operation limitation will also be put in effect to avoid disturbance to the waterfowl.

4.3.4 WETLAND PROJECTS WITH DUCKS UNLIMITED CANADA (SOURCE: QC CONSERVATION LANDS BACKGROUNDER - 2024)

Ducks Unlimited Canada (DUC) is a non-profit environmental organization who have been stewards of Canada's wetlands since 1938. The organization originally started in the United States of America in 1937 under the name Ducks Unlimited. Their core mission is habitat conservation due to the unprecedented decline in waterfowl populations caused by severe drought. The organization has since expanded to include branches in Canada and Mexico.

Quinte Conservation has partnered with DUC on a few projects throughout the Watershed to showcase different habitat restoration efforts. The larger projects are managed under an agreement with DUC for a 20-year span, during which they are responsible for any capital upgrades and maintenance that may be periodically required. The following is a list of projects:

- **Concrete Marsh Sills** at Beaver Meadow Conservation Area (former experimental vegetable farm), MF.208. Dead Creek (formerly dammed for timber drives), and MF. 207. Arnie's Mountain (acidic Fen).
- **Excavated Pairing Ponds or Wildlife Ponds** at the Longwell Demonstration Farm and the decommissioned Potter's Creek Farm.
- **Level Ditching (channels cut into monotypic cattail matts)** at MF.158. Foxboro Marsh and the Big Island Marsh.
- **Duck Nesting Boxes** have been installed at Little Bluff Conservation Area, Thurlow Wildlife Management Area, and MF.155. H.R. Frink Conservation Area. The duck boxes are utilized largely by common waterfowl like Wood, Hooded Merganser, and Golden Eye ducks, as well as other wildlife like Saw-wet Owls, Squirrels, Bees, and other cavity nesting birds. These boxes are maintained annually by volunteers.

In addition, DUC has sponsored the outright purchase of private properties for the ownership of Quinte Conservation including an addition to the H.R. Frink Outdoor Education Centre and a purchase expanding the protection and public property within the Cameron (Camden) Swamp wetland complex.

Table 17: Summary of Water Features on the QC Forest

Property Common Name	Area of Evaulated Wetlands (ha)	Area of Non–Evaulated Wetlands >= 4 ha (ha)	Shoreline of Named Waterbodies/Watercourses (km)
Ackerman	0.0	0.0	3.2
Arnie Mountain	0.0	168.9	2.3
Beaver Meadow Conservation Area	58.4	0.0	0.0
Black River Lane	0.0	5.2	3.1
Bordenwood Road	0.0	29.5	9.9
Bosley Road East	0.0	5.8	0.0
Bosley Road West	0.0	0.0	1.6
Bridgewater Road	62.0	11.2	0.0
Cameron Swamp East	19.6	0.1	0.9
Cameron Swamp South	9.6	1.8	0.6
Cameron Swamp West	39.5	1.5	6.0
Carman Creek	0.0	14.8	6.9
Cassidy Block	32.4	12.5	0.6
Clare River Centre	9.7	6.0	0.8
Clare River East	3.4	0.7	7.7
Clare River Floodplain	25.2	0.3	4.9
Clare River West	5.4	10.5	0.0
Cleveland Road	0.0	14.3	3.1
Daley Road	0.0	62.1	3.1
Dead Creek	0.0	78.6	9.9
Deerock Lake Conservation Area	0.0	0.0	1.6
Deerock Lake West	0.0	4.3	1.5
Deloro Dam	0.2	2.9	2.4
Demorestville	0.0	11.6	2.6
Dennison Road	0.0	8.4	0.0
Depot Lakes North	0.0	43.3	29.1
Depot Lakes South Conservation Area	0.0	39.1	34.7
Dog Lake	0.0	11.7	6.1
Downey Rapids	78.7	109.6	8.8
Downey Rapids South	0.0	9.8	7.4
Elzevir Road	0.0	4.7	0.0
Fifth Depot Lake	0.0	56.3	0.0
First Depot Lake	0.0	4.1	2.5
Flinton Road North	0.0	0.0	2.8
Flinton Road South	0.0	29.6	3.6
Foxboro Marsh	29.4	8.2	6.7

Property Common Name	Area of Evaulated Wetlands (ha)	Area of Non–Evaulated Wetlands >= 4 ha (ha)	Shoreline of Named Waterbodies/Watercourses (km)
Gallivan Road	0.0	26.2	0.0
Goose Lake North	31.2	17.3	4.2
Goose Lake South	6.6	0.0	0.0
H.R. Frink Conservation Area	105.0	25.5	8.5
Halloway East	0.0	0.0	0.0
Halloway West	0.0	33.3	0.0
Harry Smith	0.0	0.0	0.9
Hawkins Bay	0.0	3.6	7.4
Heron Road	0.0	52.1	0.0
Highway 7 South	0.0	22.2	0.0
Hinch Swamp	13.1	11.9	0.0
Hungerford Station Centre	0.0	9.6	0.0
Hungerford Station East	0.0	5.4	0.0
Hungerford Station North-East	0.0	7.8	0.0
Hungerford Station West	2.1	0.5	0.0
Labarge Road	0.0	44.6	0.0
Lingham Lake	0.0	0.0	3.4
Little Bluff Conservation Area	0.0	6.9	1.3
Longwell	0.0	16.7	1.0
Lost Wetland	40.0	12.5	0.0
Macaulay Mountain Conservation Area	0.0	20.0	0.0
Malone Quarry	0.0	0.0	0.8
Malone Rail Line	0.0	3.8	0.0
Marlbank Road	0.0	11.5	4.2
Massassauga Point Conservation Area	4.0	6.0	1.5
Meeks Road	0.0	11.3	0.0
Moneymore Road	0.0	34.3	0.0
Moore's Marsh	0.0	65.2	12.2
Napanee River	0.0	4.2	1.5
O'Donnell Road	0.0	30.8	7.2
O'Hara Mill Homestead & Conservation Area	0.0	0.0	0.0
Park's Creek	9.4	21.9	4.0
Portland	0.0	3.1	0.4
Potter Settlement	10.3	6.1	0.0
Potter's Creek Conservation Area	0.0	27.3	4.0
Price	0.0	0.0	0.4

Property Common Name	Area of Evaulated Wetland (ha)	Area of Non–Evaulated Wetlands >= 4 ha (ha)	Shoreline of Named Waterbodies/Watercourses (km)
Queensboro Road	0.0	1.9	3.2
Quin-Mo-Lac	16.9	6.7	0.0
Rapids Road	0.0	0.5	0.0
Rawdon	0.0	93.9	0.0
Robinson Road North	0.0	0.0	0.0
Sheffield Conservation Area	0.0	40.4	16.7
Sidney Conservation Area	0.0	12.1	0.0
Skootamatta River Centre	0.0	6.2	3.2
Skootamatta River North	0.0	4.5	9.5
Skootamatta River South	0.0	0.0	3.2
Smith Road North	0.0	24.9	0.0
Smith Road South	0.0	22.9	0.0
Springbrook Road	0.0	0.0	0.0
Storms Road	0.0	77.8	3.0
Thurlow Wildlife Management Area	216.1	7.5	12.1
Turcotte Road	0.0	1.1	0.0
Vanderwater Conservation Area	0.0	11.7	3.4
Whytock	0.0	5.7	3.1
Total	**828.2**	**1626.8**	**294.7**

4.4 DEER YARDS AND WINTERING AREAS (SOURCE: QC CONSERVATION LANDS BACKGROUNDER - 2024)

A white-tailed deer's habitat can encompass up to several thousand square kilometres; however, the winter habitat, also known as a yard, represents only 10 to 15% of that area. Proper management of a deer's winter habitat can be crucial to the survival of the overall population as deer are reported to show a strong traditional use of wintering areas and are reluctant to change their migration habits.

Generally, the wintering habitat is divided into two categories: deer yard (stratum 1) and deer wintering area (stratum 2). Typically, a stratum 2 is occupied by deer early in the winter, before the snow gets too deep (less than 30 cm). If and when, snow conditions get too deep (greater than 46 cm) and the deer are restricted in mobility, they move to a stratum 1. Ideal conditions for yards include areas with coniferous shelter to intercept snow such as white cedar and hemlock and an abundance of deciduous tree seedlings and shrubs for browsing.

The production of forage in each unique yard is strongly influenced by the age and type of the forest; Therefore, maintaining and creating the winter browsing components in the northern parts of the watershed can be a challenge if forest harvest does not occur. It is different in the southern portion of the watershed as snow depth is typically not as deep and the herd may not require a stratum 1.

Forest management activities contribute to the maintenance of these areas and can include the cutting of mature trees (individually and in groups), that are adjacent to travel routes or bedding areas (within 100 m). There is potential to harvest the hardwood forest stands using a group selection methodology to create canopy gaps for forage production, while improving the overall quality of the stand.

Of the Authority's holdings, only four property blocks have been identified as contributing to deer wintering habitat: MF 101 Cleveland Road, MF 147 Marlbank, MF 151 Moneymore, and MF 140 Vanderwater.

Millbridge - Stratum 1

The Millbridge deer yard has Crown land holdings which are being managed by the Mazinaw-Lanark Forest Sustainable Forest Licensee. One Crown land block is located directly adjacent to the Authority's holdings (Lot 20, Con 8 of Tudor and the north half of Lot 20, Con 7, Tudor). This Crown property was harvested under a shelterwood system during the winters of '95/'96 and '96/'97. This produced extensive poplar regeneration that has now reached the polewood stage, which is out of browsing reach of deer. Another Crown land block (Lots 15 & 16, Con 7, Tudor; just east of the Authority's property) received a selection harvest in tolerant hardwood in 2018.

Not too far distant from the Authority's holding, another Crown land block (Lot 30, Con 5, Tudor) was harvested using a clear-cut method to regenerate poplar as a preferred browse species. In addition, Lots 33 and 34, Con 5, Tudor also received shelterwood harvests during the same time period (2018). These local harvest activities have created a boom in winter browse supply, and thus no immediate harvest activity on the QC Forest is necessary.

As the northern portion of MF.101. Cleaveland Road is directly adjacent to the harvest activity conducted on the Crown lands in 1995, staff are recommending that the forest cover on this parcel be retained without harvest activities indefinably for direct comparison and to use as a demonstration/ educational site. Any interested parties can use the former rail line for access as it divides the Crown land from the Authority's land and can directly observe the habitat differentiation associated with stand succession. Conversely, the southern portion of MF.101. Cleveland Road (being Lot 18, Con 6, Tudor) has approximately 15 acres (6 hectares) of upland forest that could be harvested in order to enhance winter deer habitat. Being dominated by mature poplar, poor quality hardwood, and white cedar clumps, this portion of the property block is already dissected by an access trail. Although not considered commercially viable at this time, portions of this forest on this property could be enhanced through cutting to create more winter deer browse. Given the extensive harvest activities that have recently occurred on the nearby Crown lands, staff are recommending that any habitat enhancement activities on this parcel be scheduled in consultation with the Mazinaw-Lanark forest management team.

Marlbank - Stratum 1

Covering a large area of private property, the southern portion of the Authority's MF.146. Goose Lake south property lies within the Marlbank deer yard. The hardwood forest stands on this property could be harvested utilizing a group selection methodology to create canopy gaps (producing deer browse) while improving overall stand quality.

Moneymore - Stratum 2

The Authority's MF.151. Moneymore Road holding lies within the Moneymore deer yard. This property has excellent habitat for the traditional use by deer as it is a hardwood forest adjacent to a conifer swamp; within which are bedding ridges. Being a stratum 2, this deer yard is much smaller than the Millbridge yard and lies entirely within private land holdings (with the exception of the Authority's). As the only public property within this yard, the site presents an opportunity for the Authority to demonstrate wildlife enhancement activities to other private landowners. Staff recommend that a similar group selection harvest method be employed within the hardwood forest stand found on this property.

Vanderwater - Stratum 2

This yard lies entirely within private land holdings (with the exception of the Authority's). The northern portion of the Vanderwater property is coincidental with a large white cedar stand that could also be treated with the afore-mentioned group selection harvest. As the Vanderwater property has been designated as an educational commercial forest property, the opportunity exists to provide winter browse through the regeneration of hardwood forest under the existing plantations and with the demonstration of a pocket harvest management technique within the pure white cedar stand.

4.5 SPECIAL FOREST SITES (SOURCE: QC CONSERVATION LANDS BACKGROUNDER - 2024)

Due to previous land use, most of the forest cover found on QC's property holdings have been significantly altered through forest clearing for agriculture purposes, over harvesting of high-grade wood product, and significant grazing by livestock. Overall, the forest reflects these land use conditions by the absence of older, larger, high-quality trees, and the low diversity of ground vegetation - especially in stands of high commercial value like those dominated by hard maple, white cedar, hemlock, silver maple, oak, and white pine.

Few undisturbed old-growth forest ecosystems remain in the Quinte Conservation Forest. However, the best examples are the talus slope forests found in the MF.150 Cassidy Block and Macaulay Mountain Conservation Area. One of the best and largest examples of old growth forest in the watershed has been acquired by the Nature Conservancy Canada on the McLean property. This property contains old growth black maple dominated forest on a karst limestone bedrock directly adjacent to the Moira River.

Staff continue to explore the QC forest holdings and have found a few hard to reach, thus hard to exploit stands, which have been noted for exceptional floristic composition and timber quality. Although not a comprehensive list, these stands have been field inspected and are recommended as reference sites that should receive no silvicultural interventions for the foreseeable future. If possible, these forest compartments should be protected from any intrusion and allowed to follow their natural succession into an old growth status. Staff will continue to identify 'special forest sites' and will retain the records within a GIS.

Table 18 Quinte Conservation Forest Special Forest Sites

Property Name	MF Property Number	MF Compartments	Working Group
Storms Road	MF-111	5	White Cedar
Flinton Road.North	MF-114	1	Hemlock
Flinton Road.North	MF-115	1	Hemlock
Bosley Road.West	MF-119	3, 4	Cedar, Hemlock
Bosley Road.East	MF-119	8 & 9	Hard Maple
Queensboro Road	MF-121	7A & B	Hard Maple

Black River Lane	MF-122	4 & 5	Hard Maple
Downey Rapids	MF-123	36	White Cedar
Hawkins Bay	MF-126	10	Hemlock
Labarge Road	MF-127	1, 2, 3, 4	White Pine
Clare River	MF-136	4, 5, 7	White Oak
Springbrook Road	MF-138	2	Hard Maple
Rapids Road	MF-139	5	Hard Maple
Vanderwater CA	MF-140	2, 25 16, 17	White Cedar Black Maple
Dennison Road	MF-144	3	Hard Maple
Marlbank Road	MF-147	2	White Cedar
Meeks Road	MF-148	6	Hard Maple
Cassidy Block	MF-150	8 & 9 16A 17A & B 16A & B 50 69, 77A & B 86, 89 88, 89, 90, 92, 93	Maple/Oak/Hickory Oak & Ironwood Hard Maple Oak & Ironwood Hickory Hard Maple Hard Maple Maple/Oak/Hickory
Moneymore Road	MF-151	3	White Cedar
Smith Road	MF-152	1, 2 3	Hard Maple White Cedar
Lost Wetland	MF-153	4 5	Silver Maple White Cedar
Frink Centre	MF-155	1	Silver Maple
Halloy.West	MF-156	3	Red/White Oak
Halloway.East	MF-156	15	White Pine
Gallivan Road	MF-157	3 5	Black/White Oak Oak & White Pine
Sidney CA	MF-159	2	Oak & Hard Maple
Depot Lakes CA	MF-204	17 A & B, 19A,B & C	White Pine/Red Oak
Portland CA	MF-201	3	Hard Maple
Macaulay Mountain	Conservation Area	1 2	Oak/Ironwood Hard Maple
Massassauga Point	Conservation Area	2	Oak/Hickory
Thurlow Wildlife Area	Former Cons. Area	Moira R. floodplain	Silver Maple
Bitch Lake	MF-205	6	Hard Maple
Rawdon Block	MF-110	17	White Cedar/White Spruce

4.6 HIGH CONSERVATION VALUE FORESTS (HCVF)

FSC principle 9 addresses High Conservation Value Forests. The Forest Manager has evaluated the Community Forest using a framework which identifies six potential categories of HCVF:

Category 1: Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia);
Category 2: Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;
Category 3: Forest areas that are in or contain rare, threatened or endangered ecosystems;
Category 4: Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control);
Category 5: Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health); and,
Category 6: Forest areas critical to local communities´ traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

The link to the report is on the Quinte CA website certification page:

https://www.quinteconservation.ca/en/outdoor-spaces/certification.aspx

Sources of information for identifying HCVF include the OMNR's Forest Resource Inventory and Natural Resources and Values Information System (NRVIS), Natural Heritage Information Centre (https://www.ontario.ca/page/natural-heritage-information-centre), natural heritage inventories, Endangered Species Act, https://www.ontario.ca/laws/statute/07e06 and the knowledge of the forest manager and members of the community. The HCVF report has been reviewed by an independent expert.

FSC standards require that "Management activities in High Conservation Value Forests shall maintain or enhance the attributes which define such forests." Essentially HCVF's can be managed actively if the designated value receives precautionary management and regular monitoring.

4.7 AREAS OF NATURAL AND SCIENTIFIC INTEREST (ANSI)

ANSI are areas of land and water containing natural landscapes or features which have been identified as having significant values related to protection, natural heritage appreciation, scientific study or education by the Ontario Ministry of Natural Resources (OMNR, 1988). There are 1321.8 hectares of ANSI on the QC Forest, representing 10.2 percent of the total area.

Table 19 Summary of ANSI on the QC Forest

Property Common Name	Property Number	ANSI Name and Natural Heritage Significance	Area of ANSI (Ha)
Bordenwood Road	MF 209	Harlowe Bog-large undisturbed peat wetland	60.5
Cameron Swamp East	Conservation Reserve	Cameron Creek Swamp-very large and complex, marsh and swamp system	20.3
Cameron Swamp West	Conservation Reserve	Cameron Creek Swamp-very large and complex, marsh and swamp system	41.0
Clare River Centre	MF 136	Mellon Lake-rock barren landscape with rare plants	76.2
Clare River East	MF 136	Mellon Lake-rock barren landscape with rare plants	23.5
Dead Creek	MF 208	Hungry Lake Barrens-rock barren landscape with rare forest cover	339.0
Deerock Lake Conservation Area	MF 104	Elzevir Peatlands and Barrens-large and undisturbed peat wetland and rock barren complex	12.9
Deerock Lake West	MF 103	Elzevir Peatlands and Barrens-large and undisturbed peat wetland and rock barren complex	44.3
Dog Lake	MF 205	Puzzle Lake-rock barren landscape and rare plants	3.5
Goose Lake North	MF 145	Goose Creek Ponds-calcareous fen wetlands	48.2
Goose Lake South	MF 146	Goose Creek Ponds-calcareous fen wetlands	8.9
Macaulay Mountain Conservation Area	Conservation Area	MacCaulay Mountain Escarpment Forests-limestone faulting and old growth forest	86.9
Sheffield Conservation Area	MF 135	Mellon Lake-rock barren landscape and rare plants	468.4
Sidney Conservation Area	MF 159	Sager Sand Barrens and Forest Complex-rare forest cover and rare prairie plants	16.8
Springbrook Road	MF 138	Bend Bay Valley-complex of forest types and rare alvar plants	40.8
Turcotte Road	MF 134	Mellon Lake-rock barren landscape with rare plants	30.6
		Total	**1321.8**

4.8 SPECIES-AT-RISK

A "species at risk" (SAR) is any naturally-occurring plant or animal in danger of extinction or of disappearing from the province. Once classified as "at risk", they are added to the Species at Risk in Ontario (SARO) List. Table 20 contains the current list of known SAR in the Quinte Conservation CA watershed. SAR species and designations are subject to change. The Ontario government website is the current source for all SAR information, including a full list of all Species-at-Risk in Ontario.

The loss of these species is of concern because they may provide economic values like food (eg American eel), medicine (eg American ginseng), and timber (eg butternut) as well as ecosystem services such as pollination and nutrient cycling. The loss of any species can make ecosystems less resilient and often less productive.

An independent committee of scientific experts (the Committee on the Status of Species at Risk in Ontario) determines how imperilled a species is and then assigns it to one of the following categories:

Extirpated: No longer existing in the wild in Ontario, but still exists elsewhere (e.g. Greater-prairie Chicken)

Endangered: Facing extinction or extirpation (e.g. American Eel).

Threatened: At risk of becoming endangered (e.g. Bobolink).

Special Concern: Sensitive to human activities or natural events which may cause it to become endangered or threatened (e.g. Monarch Butterfly).

As soon as a species is listed as extirpated, endangered or threatened, it is automatically protected from harm under Ontario's Endangered Species Act, 2007. Also immediately upon listing, the general habitats of endangered and threatened species are automatically protected from damage or destruction. The definition of general habitat applies to areas that a species currently depends on. These areas may include dens and nests, wetlands, forests and other areas essential for breeding, rearing, feeding, hibernation and migration. This protection remains in place until a species-specific habitat regulation is created.

When a species is added to the SARO list, the process of identifying species-specific (or regulated) habitat begins. A habitat regulation provides greater certainty of what is meant by a species habitat. It may describe features of the area (e.g., a creek, a cliff, or beach, or a human-made feature such as a barn) or geographic boundaries. The description may include areas where the species is found, has been found in the past, as well as areas that may be important to a species' recovery. A species-specific habitat regulation is the legal description of a species habitat. Once a species-specific habitat regulation is created it replaces the general habitat described previously. Area of concern prescriptions for the species-at-risk most likely to occur on the QC Forest (several turtle species, American ginseng, black ash, butternut, chimney swift and whip-poor-will) have been developed. Surveys for species-at-risk are included as part of the pre-harvest natural heritage inventory of a property. If another species-at-risk is identified in a forest compartment an area of concern prescription will be implemented to protect the value in consultation with biologists from the OMNR. The location of SAR are not mapped or made available to the public to avoid creating further pressure on the species.

Table 20 Species at Risk List for Quinte Conservation Watershed

Birds (breeding range)

Species	Status	Region
Eastern Meadowlark	Threatened	PEC, Napanee, Salmon and Moira watersheds
Bobolink	Threatened	PEC, Napanee, Salmon and Moira watersheds
Black tern	Special Concern	PEC
King rail	Endangered	PEC
Bald eagle	Special Concern	PEC, Napanee, salmon and Moira watersheds
Bank swallow	Threatened	PEC, Napanee, salmon and Moira watersheds
Barn Swallow	Threatened	PEC, Napanee, Salmon and Moira watersheds
Cerulean warbler	Threatened	Moira watershed – likely other areas along southern Canadian shield.
Chimney swift	Threatened	PEC, Napanee, Salmon and Moira watersheds
Common Nighthawk	Special concern	PEC, Napanee, Salmon and Moira watersheds
Whip-poor-will	Threatened	PEC, Napanee, Salmon and Moira watersheds
Eastern wood pewee	Special Concern	PEC, Napanee, Salmon and Moira watersheds
Grasshopper sparrow	Special Concern	PEC, Napanee, Salmon and Moira watersheds
Henslow's sparrow	Endangered	PEC
Least bittern	Threatened	PEC, Napanee, Salmon and Moira watersheds
Loggerhead shrike	Endangered	PEC, Napanee
Wood Thrush	Special Concern	PEC, Napanee, Salmon and Moira watersheds

Lichens

Species	Status	Region
Golden-eye lichen	Endangered	PEC
Pale bellied frost Lichen	Endangered	PEC, Moira & Salmon

Plants

Species	Status	Region
American ginseng	Endangered	PEC, Napanee, Salmon and Moira watersheds
Black Ash	Endangered	PEC, Napanee, Salmon and Moira watersheds
Butternut	Endangered	PEC, Napanee, Salmon and Moira watersheds
Dwarf Hackberry	Threatened	Moira
Four-leaved Milkweed	Endangered	PEC
Juniper Sedge	Endangered	Napanee
Lowland Toothcup	Endangered	Salmon/Napanee (Puzzle lake area)
Small White lady's slipper	Endangered	Moira (stoco fen)
Swamp rose-mallow	Special Concern	PEC

Reptiles

Species	Status	Region
Blanding's turtle	Threatened	PEC, Napanee, Salmon and Moira watersheds
Five lined skink	Special concern	Napanee, Salmon and Moira watersheds
Eastern Musk turtle	Special concern	PEC, Napanee, Salmon and Moira watersheds
Eastern Ribbon snake	Special concern	Napanee, Salmon and Moira watersheds
Northern Map Turtle	Special concern	PEC, Napanee, Salmon and Moira watersheds
Snapping turtle	Special concern	PEC, Napanee, Salmon and Moira watersheds
Spotted turtle	Endangered	Napanee, Salmon and Moira watersheds (probable)

Mammals

Species	Status	Region
Eastern Small footed myotis	Endangered	PEC, Napanee, Salmon and Moira watersheds
Little Brown Myotis	Endangered	PEC, Napanee, Salmon and Moira watersheds
Northern Myotis	Endangered	PEC, Napanee, Salmon and Moira watersheds
Tri-coloured bat	Endangered	PEC, Napanee, Salmon and Moira watersheds

4.9 RAPTOR AND GREAT BLUE HERON NESTS AND HABITAT

Many raptors and great blue herons reuse their stick nests and/ or the surrounding habitat every year. They are relatively rare habitat features. Stick nests are assessed for evidence of activity and species. Trees with inactive stick nests are identified and retained by tree markers and reported to the Forest Manager. Where the Forest Manager confirms that stick nests are active, an area of concern prescription specific to the occupying species is applied.

Areas of concern prescriptions are focused on larger birds which have highly specific habitat requirements, form colonies and/ or tend to reuse the same nest on an annual or at least regular basis. Historically the species most likely to be identified in the QC Forest have been red-shouldered hawks which nest in mature hardwood forest, northern goshawks which nest in mature pine forests, conifer plantations or hardwood stands with a white pine component and great blue herons which nest in marshes and swamps. Great blue heron nests are listed as protected under the federal Migratory Bird Regulations (2022).

4.10 CULTURAL HERITAGE (SOURCE: QC CONSERVATION LANDS BACKGROUNDER - 2024)

Cultural heritage has been defined as the relationship between a community and its sense of identity from a shared history of beliefs, behaviours, or practices and are unique to the time period in which they were created. It is critical that cultural materials (objects, artifacts, features, and sites) be viewed and valued in context. In the case of the Quinte Watershed, there are two significant occurrences of cultural heritage belonging to the First Nations communities followed by the European pioneer settlers.

When considering the values of the First Nations community, there is limited physical evidence of their activities that was left behind. However, this is not the case with pioneer settlement activities as physical evidence of many structural pieces (including foundations/walls/chimneys, stone piles/fences, and mine shafts/head frames) and/ or wrecked vehicles/abandoned machines remain throughout the watershed.

More recent cultural heritage landscapes represent planned human actions and could include travel routes (trails, roads, and rails), town sites, dams, logging camps, or mining sites.

4.10.1 FIRST NATIONS CULTURAL HERITAGE

First Nation areas of significance which may be found on Authority owned property include:

- Harvesting and fishing areas
- Camping areas
- Recreational swimming/bathing locations
- Wildlife areas, species at risk and their habitats
- Medicinal plant gathering locations
- Edible Plant gathering locations
- Areas of plant materials gathering for traditional uses
- Fuel-wood gathering areas and access to these areas
- Canoe-grade Birch and White Cedar trees or stands
- Culturally modified trees
- Sugar bush stands (historic)
- Constructed stone formations
- Archaeological sites including registered and known sites
- Archaeological potential areas (e.g. ancient shorelines, human & wildlife travel routes)
- Natural rock formations, mineral occurrences, cliffs, bluffs, and lookouts
- Remnant Old Growth Forest stands
- Lands containing, adjacent to, or in relation to burials sites
- Pictograph/petroglyph sites and adjacent lands
- Constructed Rock formations
- Ceremonial sites for gatherings, sweat lodge, fasting, etc.
- Culturally significant wildlife species occurrences (e.g. eagle nests)
- Lands adjacent rapids
- Traditional, historic, and currently used portage trails

Within these general areas, there are more specific landscape features associated with ancient water bodies and with characteristics that increase potential for encountering ancient archaeological sites/resources. These features include, but are not limited to:

- Southerly exposures
- Relatively flat well drained soils
- Open, semi-open dry forests (red oak, red pine, white pine), oak scrub, and barrens type ecosystems
- Ancient beaches (may occur on steep slopes or have steep slopes beneath)
- Bedrock outcrops/ exposed bedrock
- Glacial erratics
- Proximity and accessibility to tool-stone gathering (especially the presence quartz veins)
- Vantage points and sight lines to other distant points and across ancient water bodies
- Point and peninsula features, bluffs, ridges, escarpments edges, plateaus, and islands
- Convergence areas of ancient water bodies and post glacial drainages
- Proximity to topographical features facilitating major wildlife movements such as narrows, and long ridge/plateau features
- Steep slopes (many ancient sites and materials are located on or below shoreline/beach benches along steep slopes)

As portions of many of these features exist on Authority lands, staff continue to foster a relationship with local First Nations communities through several senior government sources, books, and personal interviews with First Nation contacts.

4.10.2 PIONEER CULTURAL HERITAGE

Pioneering activities such as farming, lumbering, and mining left lasting negative impacts on the natural landscape. Evidence of these activities are still present throughout the watershed and are noted in the chart on next page. The list of cultural heritage sites in Table 21 have been observed by staff and through a data sharing agreement with the Ministry of Culture, Tourism, and Sport. The information represents a general overview of known resources located within the Authority's

property holdings. It is intended that these sites will remain undisturbed, therefore appropriate protection measures will take place in the event of construction or forest harvest operations in their vicinity.

4.11 AREAS OF CONCERN (AOC)

The term area of concern is used to describe values which require special consideration when planning forestry operations, including road building. Typical prescriptions for AOC may include a reserve, where no activities are carried out or a modified area, where forestry activities are modified to protect the value. Each prescription is specific to the value to be protected. Areas of concern are marked prior to timber harvesting in the field with flagging tape or paint.

Table 22 starting on page 95 summarizes the areas of concern and management prescriptions for the QC Forest. The AOC prescriptions have been compiled and adapted to fit local conditions from OMNR's Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (2010). This document will continue to serve as the primary reference if a new species or value is identified on the QC Forest which requires an area of concern prescription.

Table 21 Pioneer Cultural Heritage Sites on the QC Forest

MF.104.O'Donnell Road	Mine trench
MF.105.Malone Rail Line	Building foundations
MF.107.Deloro Dam	Power generation for the Deloro Mine site
MF.108.Ackerman	Town site Ackerman Mine
MF.109.O'Hara Mill	Water powered frame wood sawing mill
MF.110.Rawdon Block	Building foundations
MF.114.Flinton North	Building foundations
MF.119.Bosley Road West	Mine trench
MF.119.Bosley Road East	Abandoned railway
MF.121.Queensboro Road	Abandoned railway
MF.123.Downy Rapids Block	Building foundations, mine shafts, dam & stamp mill for crushing rock
MF.125.Price CA	Mine shaft, dam & stamp mill for crushing rock
MF.128.Bridgewater	Building foundation & cut granite stone fences
MF.135.Sheffield CA	Stone fireplace of abandoned cottage
MF.137.Quin Mo Lac Road	Building foundations
MF.140.Vanderwater CA	Building foundations, experimental tree plantations & First Nations campsite
MF.150.Cassidy Block	Log barn, stone bridge & experimental tree plantations
MF.155.Frink Centre	First Nations campsite
MF.159.Sidney CA	Building foundations & experimental farm works
MF.203.Depot Lake South	Timber crib dam between Second and Third lakes
MF.208.Dead Creek	Family cemetery plot & building foundations
Massassauga Point CA	First Nations campsite; foundation of 1880's hotel/ resort
Little Bluff CA	Grain storage bin foundations & Seismic station
Macaulay Mountain CA	Training grounds for armoured vehicles during WWII
Beaver Meadow CA	Early vegetable farming; dam & mill site
Milford Mill Pond	Historic mill building

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 95

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Lakes > 8 Ha	- No harvest reserve within 3 meters of the lake - The reserve width may be increased to avoid harvest on steep or shallow soiled areas or sensitive areas.	**MMZ1** - 3-15m: Zone of limited disturbance. **MMZ2** - 30 to 90 meter total AOC width (including the reserve) based on slope: **Slope (degrees) AOC Width** 0 – 8.5 30 m 8.6 –16.7 50 m 16.8 – 24.2 70 m >24.2 90 m - The AOC is measured from the high water mark.	**MMZ1:** Retain mature forest with relatively uniform canopy closure ≥ 60% (canopy opening not to exceed individual tree crowns). No harvest on steep slopes. **MMZ2:** Forestry operations will, to the extent practical and feasible, encourage perpetuation of the distinctive character of the shoreline forest while emulating natural disturbances. - Management to focus on the maintenance and enhancement of wildlife and biodiversity values. - Retain a minimum of 50% to 70% canopy closure of trees greater than 10 m in height. (For final removal cuts canopy height restriction may be reduced). - Maintain a 3 meter no disturbance zone adjacent to recognizable ephemeral streams, springs, seeps, and other areas of groundwater discharge when not solidly frozen. If these features are crossed, temporary crossing structures such as brush mats should be used. - Forestry operations will follow appropriate operating practices to minimize rutting, compaction, and mineral soil exposure - Avoid contamination of lakes or ponds by foreign materials. - No equipment maintenance within AOC.	**MMZ1:** No new roads, landings or aggregate pits. **MMZ2:** New or reconstructed roads, landings and aggregate pits should avoid the AOC wherever possible. Roads and landings may be allowed within the AOC when there are no other feasible options. - New roads that traverse the AOC will be planned wherever possible to avoid areas with a high potential to contain ephemeral streams, springs, seeps, and other areas of groundwater discharge. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 96

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Rivers, Streams and Ponds (> 0.5 Ha) High Potential Sensitivity* Apply Reserve and Full Width Modified AOC Low and Moderate Potential Sensitivity * Apply 15m or 30m Modified AOC Only * As defined in MNR, 2010	- No harvest reserve within 3 meters of the river or stream. - The reserve width may be increased to avoid harvest on steep, shallow soiled or sensitive areas.	**MMZ1 High and Moderate Sensitivity Only** - 3-15m: Zone of limited disturbance. **MMZ2 High Sensitivity** - 30 to 90 meter total AOC width (including the reserve) based on slope: **Slope (degrees) AOC Width** 0 – 8.5 30 m 8.6 –16.7 50 m 16.8 – 24.2 70 m >24.2 90 m - The AOC is measured from the high water mark. **MMZ2 Moderate Sensitivity** - The AOC width is 30 meters measured from the high water mark. **MMZ2 Low Sensitivity** - The AOC width is 15 meters measured from the high water mark (No MMZ1).	**MMZ1:** Retain mature forest with relatively uniform canopy closure ≥ 60% (canopy opening not to exceed individual tree crowns). No harvest on steep slopes. **MMZ2:** Forestry operations will, to the extent practical and feasible, encourage perpetuation of the distinctive character of the shoreline forest while emulating natural disturbances. - Management to focus on the maintenance and enhancement of wildlife and biodiversity values. - Retain a minimum of 50% to 70% canopy closure of trees greater than 10 m in height. (For final removal cuts canopy height restriction may be reduced). - Maintain a 3 meter no disturbance zone adjacent to recognizable ephemeral streams, springs, seeps, and other areas of groundwater discharge when not solidly frozen. If these features are crossed, temporary crossing structures such as brush mats should be used. - Forestry operations will follow appropriate operating practices to minimize rutting, compaction, and mineral soil exposure - Avoid contamination of lakes or ponds by foreign materials. - No equipment maintenance within AOC.	**MMZ 1:** No new roads (unless associated with an approved crossing), landings or aggregate pits. **MMZ2:** New or reconstructed roads that are not associated with an approved crossing, landings and aggregate pits should avoid the AOC wherever possible. Roads and landings may be allowed within the AOC when there are no other feasible options. - Stream crossings allowed only with appropriate permits. - New roads that traverse the AOC will be planned wherever possible to avoid areas with a high potential to contain ephemeral streams, springs, seeps, and other areas of groundwater discharge. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 97

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Open Wetlands including Provincially Significant Wetlands (PSW)	- No harvest reserve within 3 meters of the pond or wetland.	**PSW:** - The AOC width (including the reserve) is 120 meters measured from the high water mark. **Other Wetlands:** - The AOC width (including the reserve) is 15 meters measured from the high water mark.	- Management to focus on the maintenance and enhancement of wildlife and biodiversity values (den trees, nest sites, downed woody debris, provision of beaver food, etc). - Depending on the silvicultural prescription, retain a minimum of 50% to 70% canopy closure of trees greater than 10 m in height. (For final removal cuts canopy height restriction may be reduced). - Maintain a 3 meter no disturbance zone adjacent to recognizable ephemeral streams, springs, seeps, and other areas of groundwater discharge when not solidly frozen. If these features are crossed, temporary crossing structures such as brush mats should be used. - Harvest, renewal, and tending operations will follow appropriate operating practices to minimize rutting, compaction, and mineral soil exposure - Avoid contamination of ponds or wetlands by foreign materials. - No equipment maintenance within AOC. - Avoid felling of trees into wetlands. Trees accidentally felled into these features will be left where they fall.	- No new roads, landings or aggregate pits within the reserve. - New or reconstructed roads, landings and aggregate pits should avoid the AOC wherever possible. Roads and landings may be allowed within the AOC when there are no other feasible options. - New roads that traverse the AOC will be planned wherever possible to avoid areas with a high potential to contain ephemeral streams, springs, seeps, and other areas of groundwater discharge. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized.
Treed Swamps	No reserve	Boundary of Swamp	- Silvicultural prescriptions will favour maintenance of partial canopy closure to favour shade tolerant plant communities and maintain water-table levels. - Harvest and skidding restricted to frozen ground conditions.	- Access by seasonal (winter) harvesting trails only

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 98

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Intermittent Watercourses and Woodland Pools > 25 meters in diameter	- No harvest reserve within 3 meters of the feature.	- The AOC width (including the reserve) is 15 meters measured from the high water mark	- Management to focus on the maintenance and enhancement of wildlife and biodiversity values (den trees, nest sites, downed woody debris, provision of beaver food, etc). - Depending on the silvicultural prescription, retain a minimum of 50% to 70% canopy closure of trees greater than 10 m in height. (For final removal cuts canopy height restriction may be reduced). - Limited temporary corduroy or brush mat crossings of intermittent watercourses permitted. - Temporary crossings to be rehabilitated after use to ensure free flow of water. - Harvest, renewal, and tending operations will follow appropriate operating practices to minimize rutting, compaction, and mineral soil exposure - Avoid contamination by foreign materials. - No equipment maintenance within AOC. - Avoid felling of trees into intermittent watercourses and woodland pools. Trees accidentally felled into these features will be left where they fall.	- No new roads (unless associated with an approved crossing), landings or aggregate pits within the reserve - New or reconstructed roads that are not associated with an approved crossing, landings and aggregate pits should avoid the AOC wherever possible. Roads and landings may be allowed within the AOC when there are no other feasible options. - Stream crossings allowed only with appropriate permits. - New roads that traverse the AOC will be planned wherever possible to avoid areas with a high potential to contain springs, seeps, and other areas of groundwater discharge. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized.
Waterfowl Staging Areas			- No forestry operations from August 15 to December 15	- No road operations from August 15 to December 15

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 99

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Red-Shouldered Hawk	Circular: 75 m radius - No harvest. - No felling of trees into reserve. Alternate nests: 50m reserve on nests which are known to have been occupied within the last 5 years and are in good condition. Inactive nests: 20m reserve on nests which are not known to have been occupied within the last 5 years or are in poor condition.	Total AOC is circular 300 meters. **MMZ**1: 75-150 m **MMZ2:** 150-300 m - Suitable nesting habitat will be retained as a circular patch centred on the occupied nest (300 m radius circle)	**MMZ1:** ▪ Over-story canopy closure will be kept ≥ 70% using dominant or co-dominant trees. ▪ at least half the basal area retained will be comprised of trees ≥38 cm dbh (if available). ▪ Avoid creation of canopy gaps > 0.1 ha ▪ Harvest, renewal, and tending operations are not permitted during the critical breeding period (March 15 to July 15) except in extraordinary circumstances. **MMZ2:** ▪ Over-story canopy closure will be kept ≥ 70% using dominant or co-dominant trees. ▪ The residual stand structure should approximate 6-6-5-3 m^2/ha^1 for poles, small logs, medium logs, and large logs as closely as possible	**Reserve:** New roads, reconstructed roads, landings, and aggregate pits are not permitted. - No hauling or routine road maintenance unless the road predates the nest or on existing public roads. **MMZ1:** Whenever practical and feasible, new roads, reconstructed roads, landings, and aggregate pits will not be constructed within 75-150 m of occupied nests or within forest retained as suitable nesting habitat**.** **-** If roads are constructed, temporary roads and/or water crossings will be used whenever practical and feasible to limit future access and disturbance. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized. **-** Hauling is permitted during the critical breeding period. - Road construction and aggregate extraction are not permitted within 150 m of an occupied nest during the critical breeding period except in extraordinary circumstances.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 100

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Northern Goshawk	Circular: 50 m radius (0.8 ha) - No harvest. - No felling of trees into reserve. Alternate nests: 50m reserve on nests which are known to have been occupied within the last 5 years and are in good condition. Inactive nests: 20m reserve on nests which are not known to have been occupied within the last 5 years or are in poor condition.	Total AOC is circular 400 meters. **MMZ1:** 50-200 m (12.8 ha) **MMZ2:** 200-400 m (36.7 ha) - Suitable nesting habitat will be retained as a contiguous 28 hectare patch contained within the entire 400 m AOC including the reserve (total area of AOC = 50.3 Ha)	**MMZ1:** ▪ Over-story canopy closure: 7 ha will be kept ≥ 70% using dominant or co-dominant trees ▪ Canopy openings not to exceed individual crowns ▪ Canopy closure in rest of MMZ1 to be >= 50%, canopy gaps to be less than 0.1 ha ▪ Harvest, renewal, and tending operations are not permitted during the critical breeding period (March 15 to July 31) except in extraordinary circumstances. **MMZ1 and MMZ2:** ▪ The remaining 20.2 ha of suitable habitat can be located anywhere withing the total AOC: over-story canopy closure will be kept ≥ 50% using dominant or co-dominant trees. ▪ Canopy gaps to be less than 0.1 ha ▪ Suitable nesting habitat will be retained as a contiguous patch that encompasses the active nest and any inactive nests within the AOC.	**Reserve:** New roads, reconstructed roads, landings, and aggregate pits are not permitted. - No hauling or routine road maintenance unless the road predates the nest or on existing public roads. **MMZ1:** Whenever practical and feasible, new roads, reconstructed roads, landings, and aggregate pits will not be constructed within 51-200 m of occupied nests or within forest retained as suitable nesting habitat**.** **-** If roads are constructed, temporary roads and/or water crossings will be used whenever practical and feasible to limit future access and disturbance. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized. **-** Hauling is permitted during the critical breeding period. - Road construction and aggregate extraction are not permitted within 200 m of an occupied nest during the critical breeding period except in extraordinary circumstances.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 101

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Stick nests of common raptors - Broad-Winged, Coopers, Red-tailed, Sharp-shinned Hawks, Barred, Great-horned, Long-eared Owls, Merlin, Common Raven	Circular: 20 meters from the active nest tree - No harvest. - No felling of trees into reserve. **Except:** Stick nest tree only: Broad-winged or Sharp-shinned Hawks, Merlin.	Circular: 50-100 m radius from the nest depending upon species.	- Harvest, renewal, and tending operations are not permitted within specified distance of occupied nests during the critical breeding period except in extraordinary circumstances: **100 M** Barred Owl: March 1 to July 15 Broad-winged Hawk: April 15 to August 15 Coopers Hawk - April 1 to July 31 Red-tailed Hawk - March 15 to July 31 Great-horned Owl: February 15 to June 30 **50M** Sharp-shinned Hawk: April 1 to August 15 Long-eared Owl: April 1 to July 31 Merlin: April 15 to August 15 Common Raven: February 15 to June 30 - Retain inactive or satellite nest trees.	- Whenever practical and feasible, new roads, reconstructed roads, landings, and aggregate pits will not be constructed within 20 m of nests**.** - Road construction and aggregate extraction are not permitted within 100 m of occupied nests during the critical breeding period except in extraordinary circumstances. • Hauling and routine road maintenance (except that required for safety reasons or environmental protection) are not permitted within 25 m of occupied nests during the critical breeding period unless the road predates the nest or except in extraordinary circumstances. No hauling restrictions on existing public roads.
Cavity nests of common raptors - American kestrel, barred owl, eastern screech owl, great horned owl, northern hawk owl, or northern saw-whet owl	Barred owl and great-horned owl Circular: 20 meters from the active nest tree - No harvest. - No felling of trees into reserve. **All Others** Cavity nest tree only	Circular: 25-100 m radius from the nest depending upon species.	- Harvest, renewal, tending not permitted within specified distance of occupied nests during the critical breeding period except in extraordinary circumstances: **100 M** Barred Owl - March 1 to July 15 Great-horned Owl - February 15 to June 30 **25 M** American Kestrel - April 1 to August 15 Eastern screech owl - March 15 to July 31 Northern hawk owl - March 15 to July 31 Northern Saw-whet owl: March 15 - July 31 - Retain inactive or satellite nest trees.	- Whenever practical and feasible, new roads, reconstructed roads, landings, and aggregate pits will not be constructed within 20 m of barred or great-horned owl nests**.** - Road construction and aggregate extraction are not permitted within specified distance of occupied nests during the critical breeding period except in extraordinary circumstances. • Hauling and routine road maintenance (except for safety or environmental protection) are not permitted within 25 m of occupied nests during the critical breeding period unless the road predates the nest or except in extraordinary circumstances. No hauling restrictions on existing public roads.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 102

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Great Blue Heron Colony (Migratory Bird Regulations)	Circular:75 m radius from the edge of any nest. - No harvest. - No felling of trees into reserve.	Total AOC is 300 meter circular: modified is 225 meters radius from the reserve edge. **MMZ1**: 75-150 m **MMZ2**: 150-300 m	**Total AOC:** Harvesting is not permitted within 300 meters of occupied nests during the critical breeding period (March 15 to July 31) except in extraordinary circumstances. **MMZ1:** Low impact activities (eg tree marking) are permitted during the critical breeding period. - retain a minimum of 60% canopy closure of mature forest. **MMZ2:** Moderate impact activities (eg tree planting) are permitted during the critical breeding period - retain a minimum of 50% canopy closure of trees greater than 3 m in height.	**Reserve:** New roads, reconstructed roads, landings, and aggregate pits are not permitted. - No hauling or routine road maintenance unless the road predates the nest or on existing public roads. **MMZ1:** New roads, reconstructed roads, landings, and aggregate pits are not permitted except in extraordinary circumstances **-** Hauling is permitted during the critical breeding period. **MMZ2:** Whenever practical and feasible, new roads, reconstructed roads, landings, and aggregate pits will not be constructed. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized. - When roads are constructed within the AOC, temporary roads and/or water crossings will be used whenever practical and feasible to limit future access and disturbance. **-** Hauling is permitted during the critical breeding period. - Road construction and aggregate extraction are not permitted during the critical breeding period except in extraordinary circumstances.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 103

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Osprey Nest	Circular:75 m radius from the edge of the nest. - No harvest. - No felling of trees into reserve. Alternate nests: 75m reserve on nests which are known to have been occupied within the last 5 years and are in good condition. Inactive nests: 20m reserve on nests which are not known to have been occupied within the last 5 years or are in poor condition.	Total AOC is 300 meter circular: modified is 225 meters radius from the reserve edge. **MMZ1**: 75-150 m **MMZ2**: 150-300 m Alternate nests: modified is 75 meters radius from the reserve edge. Inactive nests: modified is 55 meters radius from the reserve edge.	**Total AOC:** Harvesting is not permitted within 300 meters of occupied nests during the critical breeding period (April 1 to August 31) except in extraordinary circumstances. - Wildlife trees that may function as potential nest, perch, and roost sites will be preferentially retained based on the following order of priority: 1) supercanopy trees, 2) veteran trees, 3) cavity trees and 4) other live dominant or codominant trees that are windfirm. White pines, red pines, and poplars will be favoured when available. **MMZ1:** Low impact activities (eg tree marking) are permitted during the critical breeding period. - retain a minimum of 60% canopy closure of mature forest. **MMZ2:** Moderate impact activities (eg tree planting) are permitted during the critical breeding period - for active and alternate nests, retain a minimum of 60% canopy closure of mature forest from 76 to 150 meters from nest. - for inactive nests, retain a minimum of 60% canopy closure of mature forest from 21 to 75 meters from nest.	**Reserve:** New roads, reconstructed roads, landings, and aggregate pits are not permitted. - No hauling or routine road maintenance unless the road predates the nest or on existing public roads. **MMZ1:** New roads, reconstructed roads, landings, and aggregate pits are not permitted except in extraordinary circumstances **-** Hauling is permitted during the critical breeding period. **MMZ2:** Whenever practical and feasible, new roads, reconstructed roads, landings, and aggregate pits will not be constructed. - When new or reconstructed roads traverse residual forest within the AOC, the width of the cleared corridor will be minimized. - When roads are constructed within the AOC, temporary roads and/or water crossings will be used whenever practical and feasible to limit future access and disturbance. **-** Hauling is permitted during the critical breeding period. - Road construction and aggregate extraction are not permitted during the critical breeding period except in extraordinary circumstances.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 104

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Pileated Woodpecker Nest and Roost Trees (Migratory Bird Regs)	Nest Tree	**MMZ:** 0-20 m	- Damage to the crown, stem, and roots of the cavity tree will be minimized through careful logging practices. - No marking of trees which are leaning towards the cavity tree.	**MMZ:** New or reconstructed all-weather roads, landings and aggregate pits should avoid the AOC wherever possible.
Deer Wintering Area	N/A	AOC encompasses entire identified deer wintering area.	**Conifer plantations** - Shelterwood removal cuts to maintain clumps of 3-5 conifer trees spaced 10-30m and no further than 60m apart, unless conifer regeneration is >10m in height with 60% canopy closure. **Cedar Stands** Regenerate with patch-cut (<1.0ha blocks) or strip-cut (20-40m wide). Final harvest not to occur until cedar regeneration has 60% canopy closure and is at least 5m in height. **Hardwood Stands** - Maintain conifer patches >=.04 ha (20m x 20m) in trees 10 m in height with 60% canopy closure. - Conifer patches <0.04ha are to be maintained as clumps with 3-5 conifer trees spaced 10-30m and no more than 60m apart. - Maintain single solitary conifers at least 10 m in height to link conifer patches. **General Provisions** - Where choices exist, conifer cover patches should be retained on south facing slopes, next to forest openings, over deer beds, and along travel corridors. - Deer trails and travel corridors are to be kept free of logging debris.	Planning for roads and landings should avoid critical thermal cover, bedding areas and major travel corridors.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 105

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Blandings Turtle (ESA)	Boundary of winter hibernation sites and 30 meters from nesting sites. - No harvest. - No felling of trees into reserve. 0-15 m from isolated small aquatic habitats (<0.5Ha)	- The AOC width is up to 200 meters from suitable summer habitat. **Large Aquatic Habitats (>0.5 Ha)** **MMZ1:** 0-30m **MMZ2:** 30-100m **MMZ3:** 100-200m **Isolated Small Aquatic Habitats (<0.5 Ha)** **MMZ4:** 15-50m	Operations involving heavy equipment (e.g., mechanical harvesters, skidders, bulldozers) or otherwise representing a potential injury risk to turtles (e.g., motor-manual tending) are not permitted within: **MMZ1**: April 15 to October 15 **MMZ2**: April 15 to July 7 **MMZ3:** June 1 to July 7 **MMZ4:** April 15 to July 7 and August 21 to October 15	Use of roads within the AOC will be accompanied by a strategy to mitigate potential for traffic-related mortality of Blanding's turtles. **Reserve, MMZ1, MMZ4:** No new or reconstructed roads, landings or aggregate pits except in extraordinary circumstances. **MMZ1:** Road construction and aggregate extraction are not permitted from April 15th to October 15th **MZ2:** Road construction and aggregate extraction are not permitted from April 15 to July 7 **MMZ3:** Road construction and aggregate extraction not permitted from June 1 to July 7. **MMZ4:** Road construction and aggregate extraction are not permitted from April 15th to July 7th and August 21 to October 15.
Nesting sites for northern map, eastern musk or snapping turtles (ESA)	Circular: 30 m radius from edge of the nest. - No harvest. - No felling of trees into reserve.			Use of roads within the AOC will be accompanied by a strategy to mitigate potential for traffic-related mortality of turtles. **Reserve:** No new or reconstructed roads, landings or aggregate pits. - Maintenance operations associated with existing roads or operations associated with existing landings are not permitted within the AOC from June 1 to October 31

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 106

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Black Ash (ESA)			TBD	- Whenever practical and feasible new roads, reconstructed roads, landings, and aggregate pits should avoid the CRZ of healthy black ash. - The CRZ extends the following distance from the stem of black ash trees: - 5 m for black ash trees <10 cm dbh - 10 m for black ash trees 10-24 cm dbh - 15 m for black ash trees 25-35 cm dbh - 20 m for black ash trees ≥36 cm dbh
Butternut (ESA)			- Unhealthy (category 1) butternut trees may be marked for removal if designated by Butternut Health Experts and accompanied by Butternut Health Assessment documentation. - Damage to the crown, stem, and roots of healthy (i.e. category 2 or 3 or unassessed) butternut trees will be minimized through careful logging practices. - Harvest to retain shade on at least 2 sides of dominant, co-dominant, or intermediate healthy butternut trees. - Extraction trails will be outside of the dripline of healthy butternut trees during the frost-free period, no ruts allowed within the dripline. - No marking of trees which are leaning towards an unmarked butternut tree. - to encourage butternut regeneration, group selection or uniform shelterwood management may be applied 20 m from concentrations of healthy butternut trees.	- New roads or associated landings are not permitted within the critical rooting zone (CRZ) of Category 2 or 3 butternut trees (or unassessed) butternut trees, except in extraordinary circumstances. - The CRZ extends the following distance from the stem of butternut trees: - 5 m for butternut trees <10 cm dbh - 10 m for butternut trees 10-24 cm dbh - 15 m for butternut trees 25-35 cm dbh - 20 m for butternut trees ≥36 cm dbh

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 107

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
American Ginseng (ESA)	Reserve is the perimeter of the patch.	**MMZ1**: 0-10 m **MMZ2**: 10-30 m for small patch, 10-60m for large patch	- Winter operations with frozen ground will be conducted to the extent practical and feasible - Harvest renewal and tending operations will be conducted in a manner that minimizes site disturbance **MMZ1**: Selection Harvesting - no machine traffic - trees will be felled away from the patch. - maintain residual crown closure of 70%. **MMZ2**: Selection Harvesting - maintain residual crown closure of 70%. - operations will not exceed 2% coverage of ruts and 10% coverage of extraction trails	**MMZ1:** New roads are not permitted **MMZ2:** Whenever practical and feasible new roads, reconstructed roads and landings will not be constructed**.** **-** New roads and reconstructed roads permitted within the modified AOC will be constructed to minimize potential impact on ginseng habitat (e.g., corridor width < 10 m, no grubbing, no disruption of hydrological flow) and minimize potential for illegal collection (e.g., locate road as far from ginseng patch as possible and where patch is not visible from road); winter roads will be used to the extent practical and feasible.
Chimney Swift Nest and Roost Trees (ESA)	Nest Tree	**MMZ:** 0-30 m	Harvest, renewal, and tending operations are permitted within the AOC subject to the following conditions: - The nest/roost tree(s) will be retained - Harvest, renewal, and tending operations are not permitted from May 1 to September 30 when there are occupied nests/roosts except in extraordinary circumstances - Operations involving heavy equipment or that might otherwise adversely affect nest/roost trees or the amount of vertical or lateral cover are not permitted within 20 m of natural nest or roost sites	**MMZ:** New or reconstructed all-weather roads, landings and aggregate pits should avoid the AOC wherever possible. - Road construction and aggregate extraction are not permitted from May 1 to September 30 - no timing restriction on forestry-related traffic or low potential impact road maintenance operations (e.g., grading) if the road predates the nest/roost site
Whip-poor-will nesting territories (ESA)	N/A	**MMZ**: 0-200m from reliable observations of eastern whip-poor-will breeding habitat	- Harvest, renewal, and tending operations are not permitted from May 15 to July 31 - Nests encountered during operations will be retained in an unharvested residual patch ≥50 m in radius	- Whenever practical and feasible new roads, reconstructed roads and landings will not be constructed**.** - Road construction and aggregate extraction not permitted from May 15th to July 31

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 108

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Existing Old Growth Forest Ecosystem	Forest Stand			
High Potential Old Growth Forest Ecosystem	N/A	Boundary of Forest	Prescription to be developed to maintain and/ or enhance old growth forest ecosystem attributes.	- New or reconstructed roads should avoid the AOC wherever possible. - When new or reconstructed roads traverse the AOC, the width of the cleared corridor will be minimized.
Uncommon Tree Species	As Required	Boundary of Forest	Prescription to be developed to conserve forest ecosystem of concern. Depending upon age and condition of forest, conservation may focus on maintaining existing trees or developing regeneration.	- New or reconstructed roads should avoid the AOC wherever possible. - When new or reconstructed roads traverse the AOC, the width of the cleared corridor will be minimized.
Significant wildlife habitat features listed in Ontario Significant Wildlife Habitat Guide, OMNR, 2000 (eg alvars, caves)	As Required	Boundary of Feature	- Feature will be identified as a Special Forest site - Prescription to be developed to maintain and/ or enhance ecosystem attributes. - https://www.ontario.ca/page/significant-wildlife-habitat-guide	- New or reconstructed roads should avoid the AOC wherever possible. - When new or reconstructed roads traverse the AOC, the width of the cleared corridor will be minimized

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 109

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
Cultural Heritage Site (Indigenous) Potential examples include constructed or natural stone features, culturally modified trees, historical camps	Dimension of reserve to be determined by Forest Manager in consultation with Indigenous representative.	To be determined	- Objective is to maintain site integrity - Forestry activities will avoid disturbance to value and adjacent site/ soil	- New or reconstructed roads should avoid the AOC wherever possible. .
Cultural Heritage Site (Other) Potential examples include evidence of old farming, logging or mining activity.	Dimension of reserve to be determined by Forest Manager. Finds of potential significance will be reported to local historical representative.	To be determined	- Objective is to maintain site integrity - Forestry activities will avoid disturbance to value and adjacent site/ soil	- New or reconstructed roads should avoid the AOC wherever possible.
Authorized Recreation Trails	N/A	N/A	- Forest operations will be conducted with public safety in mind by installing warning signs, removing hazard trees (e.g. leaning), and keeping trails free of logging debris. - Trails may be closed for all or part of forestry operations when required to ensure public safety.	- Place Warning or Caution signs at strategic points along the trail and within a reasonable distance of planned operations to advise the public of forest operations. - Where required, limited use of trails for hauling and occasional skidding is allowed as long as the trail is kept free of logging debris and left in a condition consistent with its intended use.

Table 22 Areas of Concern For Natural and Cultural Heritage Values - 110

VALUE	RESERVE	MODIFIED		ROADS
	DIMENSION	DIMENSION	CONDITIONS	
MNR Growth and Yield Plots (May be managed or unmanaged)	Dimension of reserve (if any) to be determined by Forest Manager in consultation with MNR Forest Productivity Science Specialist	Dimension of modified area (if any) to be determined by Forest Manager in consultation with MNR Forest Productivity Science Specialist	- Timely notification to MNR Forest Productivity Science Specialist in advance of forest operations to allow for potential plot remeasurement. - Damage to all aspects of the plot to be minimized through careful logging practices.	New roads, reconstructed roads, landings, and aggregate pits are not permitted.

4.12 TREE MARKING CONSIDERATIONS FOR NATURAL HERITAGE VALUES

Many important natural heritage values are identified and protected by the Forest Manager as part of tree marking and harvesting operations. Many areas of concern which are included in the previous table 22 are often identified by tree markers: these include vernal pools, intermittent streams, active stick nests, species at risk, old growth forest remnants, and pioneer homesteads.

The Ontario Ministry of Natural Resources oversees the training and certification of tree markers who work on crown land. The training and testing is delivered by Forests Canada and the Canadian Institute of Forestry. The EOMF has adopted the requirement for use of OMNR certified tree markers as a mandatory policy for participants in their certification program. OMNR certified tree markers are trained to identify and protect numerous natural heritage values as part of their tree marking activities. Certified tree markers must also attend a refresher course every five years where they are updated on changes or additions to Provincial guidelines.

Table 23 provides a summary of additional natural heritage values which are regularly identified and protected during tree marking and harvesting operations. These guidelines have been developed by the OMNR and accepted as best management practices. These guidelines have been compiled from OMNR's Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (2010) and the 2021 Forest Management Plan for the Mazinaw-Lanark Sustainable Forest License (SFL). The application of these guidelines contributes to the maintenance of a healthy forest ecosystem, the protection and enhancement of wildlife habitat and the conservation of forest biodiversity.

The following excerpts from the Ontario Tree Marking Guide, Section 4.0, Tree Marking for Wildlife Habitat and Biodiversity (2004) briefly summarize three more of the most common values identified by tree markers in the field. The reader is encouraged to read the Guide for further information on these and other values identified and protected by tree markers.

CAVITY TREES

About a quarter of all birds and mammals use holes or cavities in trees for nesting, denning, roosting, resting, or hibernating. Priority for retention of cavity trees is based on the type of cavity (eg nest vs escape), worker safety, size, species and health of the tree, and dispersion. Pileated woodpecker nest cavities are protected under the federal Migratory Bird Regulations (2022).

MAST PRODUCING TREES

The term mast refers to the edible fruits of plants. Mast is consumed by about 25% of birds and mammals in the Forest. The most common mast tree species on the QC Forest are red, white and bur oak, beech, and ironwood. Black cherry, hickory, basswood, and butternut are less common but also important. A diversity of mast species will minimize the risk of a total mast-crop failure. Priority for retention of mast trees is based on the tree species, size of tree, crown position and overall health of the tree and crown.

SCATTERED CONIFERS IN HARDWOOD STANDS

Scattered conifers are used by about 10% of the wildlife that inhabit upland tolerant hardwood forests. For example, they provide refuge and bedding sites for black bears, roosting sites for barred owls, and nesting sites for black-throated green warblers. Priority for retention of solitary conifers is based on the tree species, size of tree, and overall health of the tree and crown.

Table 23: Tree Marking Considerations For Natural Heritage Values

Value	Operational Guidelines
Biodiversity	Maintain a natural mix of tree species, retain less common tree species. Examples include: 1) Retention of mid-tolerant species in tolerant hardwood stands (eg red and white oak, hickory, basswood, black cherry) 2) Retention of individual "veteran" trees. 3) Creation of "opportunistic" group openings.
Cavity Trees	Maintain an average of 10 living cavity or den trees per hectare (trees with dbh at least > 25cm and preferably ≥ 38 cm dbh). Where cavity trees are not available, recruit such trees by leaving poor quality stems, especially living trees. Trees should be well distributed and of different species.
Snags	Encourage operators to leave snags (dead standing trees) that are not a safety risk. Leave snags that are in various stages of decay.
Downed Woody Debris	Downed Woody Debris (DWD) includes unmerchantable logs, limbs, branches and stumps on the forest floor. Leave coarse woody material on site. Encourage operators to leave hollow logs in the bush.
Supercanopy Trees	Maintain 1 supercanopy tree for every 4 hectares. Trees will be taller than the height of the main canopy of the forest and should be relatively healthy and windfirm.
Mast Producing Trees	Retain an average of 10 mast trees per hectare (butternut, hickories, oaks, black cherry, basswood, walnut, beech, ironwood) where available. Trees should have large, healthy crowns and be at least >25cm dbh (Ironwood >10cm dbh) and preferably ≥ 38 cm dbh.
Scattered Conifers in Hardwood Stands	Retain and manage individual and small groups of hemlock, pine, cedar and spruce trees in hardwood stands to provide shelter and feeding areas for wildlife and to maintain tree species and structural diversity. Retain an average of 10 hemlock, pine, cedar and spruce stems per hectare where available. Trees should be >25cm dbh where ever possible and preferably ≥ 38 cm dbh
Stick Nests of Unidentified Status and Owl Nests	Attempt to identify the species most likely to use the nest. If identification fails – retain and protect the nest tree and all trees with crowns touching it or leaning in a way that would unavoidably damage the nest tree if felled.

5.0 FOREST HEALTH

There are numerous insects, diseases, abiotic and wildlife population stresses that impact the health of the QC Forest. The Ontario government monitors forest health conditions and provide updates to Forest Managers through regular information meetings. Detailed descriptions of forest health issues and current status reports can be found at: https://www.ontario.ca/page/forest-health-conditions Table 24 lists the major forest health challenges and the main host tree species which they impact. The greatest threats to the forest are invasive pests with few or no natural biological controls. Historically, white pine blister rust, dutch elm disease and spongy moth have had the most significant impacts on the forests. More recently butternut canker, emerald ash borer (EAB) and beech bark disease (BBD) have resulted in large scale tree decline and mortality throughout the watershed. New infestations of hemlock wooly adelgid (HWA) and oak wilt in Ontario are the latest potential challenges on the horizon for the QC Forest. The infestation of asian long-horned beetle in Toronto, while potentially devastating to QCs hardwood forests, is considered eradicated at this time.

Maintaining healthy forests and species and genetic diversity is the most practical defense against forest health issues. Sustainable forest management practices are designed to maintain a diversity of high-quality tree species growing on suitable sites and to favour natural regeneration of a diversity of species. Tree markers select declining stems for removal while retaining healthy individuals of tree species, even those that are under threat of disease. For example, despite continued extensive mortality in white elm, healthy elm trees continue to exist and to produce seed and seedlings. Healthy elm trees are retained during tree marking and logging operations to provide a seed source for the future.

Some pests like white pine blister rust and gypsy moth selectively impact some of their hosts: tree markers can identify and remove those stems. For example, a major outbreak of the gypsy moth heavily impacted the Oak Hills area (e.g. MF.156.Halloway West). Other pests are not selective and inevitably deadly to most affected trees. Tree markers must remove the majority of infected or infested ash and beech trees before they die and create safety concerns. The exception to this are butternut and black ash trees, which are protected species under the Endangered Species Act.

Table 24: Quinte Conservation Forest Health Challenges

Stress	Favoured Hosts	Invasive/ Native	Potential Damage
Insects			
Spruce Budworm	Spruce, Fir	Native	Low (cyclical)
Forest Tent Caterpillar	Poplar, Other Hardwoods	Native	Low to Moderate (cyclical)
Spongy moth	Oak, Other Hardwoods	Invasive	Low to Moderate (cyclical)
Larch Casebearer	Tamarack, Larch spp.	Invasive	Low to Moderate (cyclical)
Cedar Leaf Miner	Cedar	Native	Moderate to High (cyclical)
White Pine Weevil	White Pine	Native	Moderate
Emerald Ash Borer	Ash spp.	Invasive	High
Hemlock Wooly Adelgid	Hemlock	Invasive	High (recent introduction to Canada)
Oak wilt	Oak spp.	Invasive	High (recent introduction to Canada)
Asian Long - Horned Beetle	All Hardwoods	Invasive	High (currently eradicated)
Diseases			
White Pine Blister Rust	White Pine	Invasive	Low to moderate
Beech Bark Disease	Beech	Invasive	High
Root Rot Fungus (e.g. Armilleria, Fomes)	Spruce, red pine	Native	Low to moderate
Dutch Elm Disease	Elm	Invasive	High
Butternut Canker	Butternut	Invasive	High
Other			
Wind	All Species		High (Localized)
Drought	Oak, Ash, Red Pine		Moderate
Ice, Snow	All Species		Moderate
White-tailed deer	Hardwoods, Cedar, White Pine, Hemlock		High (Localized)

5.1 WIND EVENTS

Wind has always had an impact on forests and has typically created small forest gaps which allow mid tolerant tree species to regenerate. Recently a number of significant wind events have occurred which have created much greater levels of destruction. In 2002 a microburst in areas south of Bancroft destroyed numerous forests, including a grove of large white pines in the village of Cloyne. In 2022 two major wind events occurred in the area along and north of Provincial Highway 7. Both the Derecho wind event in May and tornado in July caused catastrophic damage to forests. The MF.101.Cleveland Road block was directly impacted by the Derecho. The forest blocks of MF.128.Bridgewater Road and MF.130.Potter's Settlement were salvage harvested for red pine due to the direct hit of the tornado.

5.2 ICE STORMS

In April of 2025, an ice storm further affected the northern portion of the watershed. Accumulating 25 mm of ice, many trees received canopy damage however white cedar was particularly impacted.

5.3 WHITE-TAILED DEER

Although a native species, white-tailed deer populations have grown to high levels in parts of the watershed. This tends to occur in areas where there is a mix of forest and agricultural habitat, limited hunting, and milder winter temperatures. When deer populations exceed carrying capacity they can eradicate most tree species regeneration by over browsing. This can affect a variety of native hardwood and conifer tree species as shown in Table 24. In these areas the main species not overly affected by browsing are white spruce, red cedar, ash and beech

5.4 FIRE

Fire protection is the responsibility of the municipalities. If required the municipality can call in Emergency Services which includes OMNR fire suppression.

Forestry staff and forest contractors carry basic fire protection equipment, primarily oriented for vehicle or equipment fires. Should a major fire occur, staff and contractors have been instructed to contact the municipal fire departments.

The storm events that occurred in 2022 will have wildland fire fuel complications for a long time. As a result of the storm damage to forest fuels, and potential resulting challenges with control of wildland fires in the future, the Municipality of Tweed prepared a Community Wildland Fire Protection Plan for 2024-2025**.**

5.4.1 PRESCRIBED FIRE

Prescribed burning has been widely used across Southern Ontario to assist with ecosystem restoration (primarily in Oak savanna and prairie ecosystems). Quinte Conservation has conducted two prescribed burns on the shagbark hickory & bur oak alvar woodland at Massassauga Point Conservation Area.

The First Nations were very adept at prescribed burns, and it is widely accepted that anthropogenic fires were very important to maintain open campsites (often near river mouths or portages over rapids on major rivers), create ungulate browse, open forests for agricultural planting, and to assist with maintaining medical/food plants gathering areas (like blueberries). Highly valued by both humans and wildlife, oak and hickory stands provide hard mast; and thus are very important to maintain on the landscape (especially when other mast producers are in decline – like Butternut and Beech).

Staff have compiled a list of forest sites where prescribed burning could assist with maintaining oak species on the landscape over time (Quinte Conservation, 2022).

5.5 INVASIVE EXOTIC PLANT SPECIES

An invasive exotic plant species is a non-native plant that threatens to replace native species by occupying the same ecological niche. From an ecological perspective, the concern centers on the displacement of diverse native species, the impacts on interrelated species (those that rely on native plants for food and other values) and reduced genetic diversity.

Common and glossy buckthorn, garlic mustard, and dog strangling vine are the best known examples of invasive exotic plant species which exist in forests in this area. The most common invasive plant species in wetlands was purple loosestrife and is now phragmites. To date Quinte Conservation has not initiated control measures for these species, except for the targeted efforts at the Massassauga Point Conservation Area. Since 2010, extensive buckthorn removal has taken place with manual brushing, herbicide application and prescribed burning assisting with the suppression of the natural seed bank. Despite these efforts, only a small area of the property continues to exhibit the original forest stand structure of a bur/chinquapin oak and shagbark hickory alvar savannah.

The Forest Manager will continue to monitor the presence of invasive exotics as part of existing forest monitoring programs (e.g. property inventory or reconnaissance, harvest planning, harvest monitoring). Should a significant concern with invasive exotics arise, the Forest Manager will develop and apply practical control measures.

6.0 FOREST PRODUCTS

6.1 HISTORY OF THE LUMBER AND PULPWOOD INDUSTRIES

(Sources: Long and Whiteman, 1998. Ontario Government. 1950 and 1957)

Forest products markets have evolved continuously since the early days of settlement. Market changes occur regularly because of changes in demand, available supply and more recently global competition.

From the 1790s onward, entrepreneurs constructed dozens of water-powered sawmills in the watershed to supply lumber for local settlers. Although white pine was the focus of much of the early lumber trade, local construction and furniture trades stimulated the demand for white oak, ash, and elm lumber.

In the early 1800s the Royal Navy's desperate need for naval timbers and masting, coupled with the demand for general building timber in England and the United States touched off an era of intense logging in Ontario which was to last over 100 years. The Bay of Quinte became an important focus of lumbering and sawmilling during this time. The Bay receives outflow from four important rivers: the Trent, Moira, Salmon and Napanee. The forests in these watersheds contained immense stands of large, high-quality pine, as well as sugar maple, basswood and hickory. As readily accessible timber along the Lake Ontario shore was depleted, logging operations moved up the tributary rivers and pine timber was driven downstream to mills.

Initially squared timber was assembled into rafts and floated to Quebec City for shipment. Squared timber was only made from pines, which were more than one metre at the stump and thirty-eight metres long. By the 1830s, declining demand for square timber from England was being replaced by increasing demand from the United States for sawn lumber. The focus of the lumber industry changed from shipping squared timber to sawing and shipping lumber, which created jobs and wealth locally. The American markets also created a demand for hardwood tree species which

had been underutilized. The Crown Timber Act of 1849 allowed for the awarding of timber licences on ungranted public lands, creating opportunities for acquiring large timber limits.
The rivers were used as the major transportation route to get timber to the sawmills until the early 1900s. The last log drive on the Napanee River was in 1905 and the Moira River was in 1907. Timber slides, dams and chutes were constructed to facilitate the movement of logs. Railway lines such as the Ontario Central and Napanee-Tamworth-Quebec (NT&Q – opened by the Rathbun Company in 1884) were later used to transport lumber to markets.

In 1836 there were 15 water-powered sawmills operating on the Moira River and 11 on the Napanee River. The number of sawmills continued to grow until the 1850s, but depletion of local timber in the more settled townships, improvements in roads, and the introduction of steam-powered mills drove the change to fewer, larger sawmills. Many water-powered mills in the southern townships had disappeared by the 1870s. One of the first steam sawmills in Upper Canada was constructed by square timber dealer Billa Flint in 1836 Belleville at the mouth of the Moira River. In 1848 the Rathbun company built a large steam powered sawmill near the mouth of the Napanee River. The town that grew up around the mill and its complex of industries became known as Deseronto. The large Gilmour and Company sawmill was built in in 1852 in Trent Port (Trenton). In 1860 the sawmill at Napanee Mills (now Strathcona) turned out 9 million board feet of lumber per year. By the 1870's, the lumber trade (logging, river drives, sawmilling, and wood-working plants) were the chief cause of Belleville's prosperity. 150, 000 to 175,000 sawlogs were annually driven down the Moira River to Belleville during that period, and Belleville sawmills had the capacity to produce 175,000 board feet (fbm) every day.

The peak of lumber production was 1880-1890. These mills were responsible for much of the growth of communities in the area, but eventually closed when the large volumes of economical timber which they required were depleted. For example, in the 1890s the Gilmour Company had to acquire timber limits in the Canoe Lake area of Algonquin Park to find sufficient volumes of white pine for their mill. This necessitated the construction of an elaborate tramway to raise logs over the height of land from the Oxtongue River watershed to the headwaters of the Trent River system. Needless to say, the costs incurred and time required to drive timber this distance were not economical. For a compelling description of this enterprise readers are encouraged to refer to

the 1998 book “When Giants Fall: The Gilmour Quest for Algonquin Pine” by Gary Long and Randy Whiteman. The Gilmour and Company sawmill closed in 1905 and the Rathbun Company ceased operations in the 1920s.

Family owned and operated Chisolm Lumber in Roslin, Ontario serves as an interesting contrast to these other sawmills. The company started in 1857 when William Fraser Chisolm purchased a sawmill on the Moira River and continues to operate today under the direction of the 6th generation of the family. They primarily saw hardwood lumber with a small component of conifers. Their diverse operations include forest management services, a retail yard, kilns and custom home building.

Large scale commercial harvesting of woodlots became more productive with the development of mechanized logging equipment in the 1950s. Most commercial activity in the watershed in the last half of the 20th century was focussed on hardwood and softwood sawlogs, hardwood pulpwood, and firewood. The advent of log trucks allowed the industry easier access to markets such as the pulp and paper mills in Trenton and Cornwall. As standards of forest management improved these pulp and paper mills became a critical market for the lower quality material harvested from Crown and private forests.

The pulp and paper mill in Trenton was a major player in the local forest industry for close to 100 years. The mill opened in 1927 as the Hinde and Dauch paper factory on Marmora Street, manufacturing 30 tons a day of corrugated medium for packaging from oat and wheat straw. Corrugated medium is the centre layer of packaging between two pieces of linerboard. In the 1950's, straw was replaced with hardwood fibre.

By the 1990s the mill (owned by Domtar Inc since 1965) was using about 100,000 oven dry metric tonnes of hardwood pulpwood (primarily poplar and maple) per year and an equivalent amount of recycled fibre in their paper. The company owned over 24,000 hectares of forest land in the Gilmour area south of Bancroft and provided a woodlot management program for local private landowners. Their forest management activities were certified by FSC®. In 1999 it became the first mill of its kind to institute a requirement that all of its logs be sourced from sustainably

managed forests. The mill was last owned by Cascades Inc. and closed in 2024. The Nature Conservancy of Canada purchased approximately half of the Domtar private land holdings for long term preservation, including approximately 2000 hectares in the upper Moira River watershed.

The 21st century continues to bring significant challenges to the forest industry. The reduction in demand for Canadian paper products brought about by electronic communication, increased global competition, and escalating energy, fibre and labour costs have affected all forest products companies. Additional pressures facing individual mills and sectors include aging equipment and the softwood lumber tariffs imposed by the U.S.A. In addition to Trenton, three other local hardwood pulp mills (Cornwall, Portage du Fort, and Thurso) have closed since 2005. The loss of market for low quality wood has created a major challenge for the logging industry.

6.1.1 O' HARA MILL HOMESTEAD AND CONSERVATION AREA

In May of 1850, James O'Hara Sr. and his son James O'Hara Jr. entered into a partnership. The father agreed to erect and build a sawmill, while the son agreed to supply the site with timber as well as water privileges. This was the beginning of the O'Hara Mill, which continued to cut and sell lumber up until 1908, some fifty-eight years later. In 1954, the Moira River Conservation Authority (now Quinte Conservation) purchased the mill and adjoining land. A park was developed and enlarged in 1965, when the homestead was purchased from Minnie O'Hara Maines. To this day, five of the original buildings; the farmhouse, sawmill, carriage-house, shed and woodworking shop remain in a restored condition, thanks to numerous volunteer hours and generous donations from individuals and businesses in the community.

Since 1965 the Homestead has expanded with the addition of relocated buildings from the surrounding area. A log cabin originally located at the Sheffield Conservation Area, now houses a blacksmith's shop. An original schoolhouse dating back to 1861 was relocated to the site from Elzevir Township. The latest additions to the homestead are a rebuilt log house circa 1850 erected on the site of the original homestead in 2008, and a Visitors Centre built in 2009. The O'Hara Volunteers Association supports the operation of the facility and are committed to maintaining, enhancing and preserving the local heritage.

6.2 CURRENT MARKETS

CONIFER

Conifer from the thinning of plantations makes up the majority of the wood harvested from the QC Commercial Forests. This market is actually a relatively recent development. For many years there were few markets available for small diameter red pine. Most first thinnings were accomplished by special employment projects, with much of the wood left on the ground or sold at minimal value for firewood. In the 1990s, two Ottawa Valley sawmill entrepreneurs (Laverne Heideman and Sons Ltd Eganville, Ben Hokum and Sons Ltd Killaloe) recognized the opportunity to harvest this underutilized wood supply. They found markets for the small dimension lumber in the furniture and pressure treating businesses and modified their sawmill operations to saw these smaller trees. To improve efficiencies in the logging of these smaller trees, small mechanized tree harvesters and forwarders were introduced. Today, red pine plantation thinnings are the major timber revenue source for the QC Forest.

There are other markets for conifer logs. Mature white and red pine trees continue to be valued for the production of sawn lumber by Ottawa Valley sawmills. Large, straight, knot-free red pine trees are the preferred supply for manufacturers of poles and log homes. Markets for cedar lumber, posts and pickets also remain strong.

HARDWOOD

Hardwood forests make up a relatively small portion of the QC Commercial Forest. Harvest of hardwood forests has been the bread and butter of the local forest industry for many years: however, hardwood markets have fluctuated substantially in recent years. Many of the hardwood forests owned by Quinte Conservation are of previous agricultural origin, and have a history of disturbance including fuelwood and sawlog harvest, grazing and land clearing. Thinning in these hardwood forests which have not been previously managed results in the removal of small diameter and lower quality trees; there are relatively few hardwood sawlogs harvested. Over 2/3 of the volume typically thinned in the first managed cut from hardwood woodlots is low grade or

small trees. With proper management, long-term yields of quality hardwood sawlogs will increase, creating better revenue opportunities.

Traditionally large volumes of low-quality hardwood logs were delivered in eight-foot lengths as pulpwood to Cascades' pulp and paper mill in Trenton and Domtar's pulp and paper mill in Cornwall. With the permanent closure of these mills the market and price for hardwood pulpwood substantially declined.

The other major market for low quality hardwood logs is firewood. Firewood demand grew during the 1970s as a result of dramatic increases in oil prices, but declined slowly during the 1980s and 1990s as oil prices dropped and natural gas availability increased. With recent drastic spikes in oil, electricity and natural gas prices, the demand for firewood is again on the upswing and is helping to offset the loss of the pulpwood market. Firewood is sold by the full cord in log or tree lengths and by the face cord as cut and split. Preferred firewood species include sugar maple, beech, and hickory which have high heat value. Soft maple and ash have lower heat value but are still regularly used for firewood. Oak has high heat value but is not always favoured because of the length of time required to dry properly. Poplar and basswood have low heat value and are not desired as firewood.

Sawmills have traditionally provided a ready market for the higher value sawlogs, although these operations have not been exempt from the challenging operating environment facing the forest industry. The predominant species of hardwood sawlogs cut are sugar maple, red and white oak, ash and basswood. Most of the hardwood sawlogs from the QC Forest are sold locally to Chisolm Lumber in Roslin or into Quebec markets.

LOGGERS

The changes that have occurred in the local forest industry have had substantial impacts on the local logging community. Over the last 20 years, three major changes have brought about a drastic decline in the numbers and fortunes of logging contractors. First, uncontrolled logging on private land greatly reduced the availability of quality sawlogs, both through a decline in woodlot quality

and a greater reluctance of a changing demographic of private landowners to allow logging on their property. Second, continued cost pressures on large pulp and paper mills resulted in minimal real price increases or even price reductions for pulpwood. Finally, the advent of mechanized harvesting equipment designed to harvest large volumes at low cost reduced the competitive advantage of traditional small logging businesses, who relied on traditional cut and skid methods. As a result of these changes, there has been a substantial decline in the number of full-time logging contractors in south-eastern Ontario.

For the remaining contractors operating successful logging businesses in south-eastern Ontario, community forests offer important opportunities for sustainable timber harvesting.

6.3 FOREST OPERATIONS PLANNING

The discussion paper for the Commercial Forest properties identifies the properties to be harvested and serves as the Ten-Year Operating Plan covering the period until December 31, 2027. This will be updated to a new Ten-Year Operating Plan for the period 2028 – 2037 at the time of MFTIP plan renewal.

For each harvest area, a site-specific forest operations prescription is prepared by a member of the Ontario Professional Foresters Association (OPFA) outlining the silviculture and tree marking prescriptions, access requirements, boundary lines and prescriptions for protecting natural and cultural heritage values. Boundaries of forest operations are established in cooperation with adjacent landowners using field evidence such as survey markers or fencing. Stands are marked for harvest and buffers around natural and cultural heritage values established by tree markers who have successfully completed the OMNR Level 1 Tree Marking Certification course.

6.4 AVAILABLE HARVEST AREA (AHA)

The calculation of available harvest area (AHA) refers to the **annual** harvest level that could continue indefinitely without exceeding the productive capacity of the forest. A sustainable AHA ensures that forests products can be harvested on a regular basis to provide both long-term employment opportunities and revenue to Quinte Conservation. For a Community Forest, AHA is typically an area-based calculation. The reliability of a Community Forest AHA relies on the local knowledge of the Forest Manager who provides the inputs. AHA is calculated only for areas that are eligible for harvest and can support a commercial harvest. The length of time required for stands to grow enough merchantable volume to support a commercial harvest and the rate of development of forest regeneration (i.e. harvest cycle) are also factors in the AHA. Due to species variability and differences due to stage of management, an AHA is calculated for each forest type.

HARVEST ELIGIBILITY

Harvest eligibility is an estimate of the amount of area that can be managed for commercial harvest operations. Like many Community Forests, the actual area eligible for harvest on the QC Forest is a small fraction of the total forest area. Quinte Conservation has identified 2,399 hectares as Commercial Forest properties which are available for harvest (Quinte Conservation, 2019). This includes 1,847 hectares of forest and 552 ha of open land (non-forest). This represents 18.4% of the total property area and 18.7% of the total forested area.

HARVEST CYCLE

Harvest cycle describes the length of time expected between treatments for an average stand of merchantable age. The length of time between treatments varies depending on the species involved and the type of silvicultural treatments. Typically, plantation thinning occurs on a shorter cutting cycle (i.e.10 - 15 years) than single-tree selection in a tolerant hardwood forest (20-30 years) or a clear-cut in a poplar stand (60-80 years). Shelterwood harvests typically include two or three harvest cuts scheduled to establish and develop regeneration of a new even-aged forest.

The **annual** AHA is calculated for each forest type as follows:

$$\frac{\text{Eligible Area of Forest Type (Ha)}}{\text{Harvest Cycle (Years)}}$$

No AHA has been calculated for the smallest forest types. Stands of these forest types will be allocated as part of larger harvest blocks as encountered.

The AHA for each forest type is summarized in Table 25. The annual harvest for the QC Forest represents less than 1% of the productive forest area.

The AHA should be reviewed during the preparation of each Operating Plan using information from permanent sample plots and local knowledge with regard to forest health impacts (e.g EAB, BBD), growth rates, and the effectiveness of silvicultural treatments.

Table 25: Quinte Conservation Forest Available Harvest Area (AHA)

Forest Type	Harvest System	Total Area (Ha)	Total Area (Ac)	Harvest Cycle	Annual Harvest (AHA) (Ha)	Annual Harvest (AHA) (Acres)
Red Pine	Commercial Thinning	331	818	12	27.6	68.2
White Pine	Shelterwood	387	955	20	19.4	47.8
White Cedar	Commercial Thinning	101	249	15	6.7	16.6
Other Conifer Plantation	Shelterwood	96	236	15	6.4	15.7
Hemlock	Selection	55	136	25	As Encountered	
Tolerant Hardwood	Selection	431	1066	20	21.6	53.3
Oak	Shelterwood	105	260	30	3.5	8.7
Hardwood Shelterwood	Shelterwood	168	414	50	3.4	8.3
Lowland Hardwood	Selection	108	266	20	5.4	13.3
Intolerant Hardwood	Clearcut	65	160	70	As Encountered	
Total		1,847	4,560		94.0	231.9

6.5 SALE OF WOOD PRODUCTS

Commercial wood harvest on the QC Forest is carried out by Herrington Logging Inc. This long-term arrangement has proven to be beneficial to the Forest as a high standard of operations has been maintained by a multi-generational pride in workmanship.

The scaling of conifer species is carried out using weigh scales to measure wood at the delivery point. The measurement of hardwood sawlogs is completed using traditional scaling methods at the mill site, and a copy of the scale provided to Quinte Conservation for verification. Alternatively, arrangements may be made for an on-site measurement of sawlogs by a scaler approved by Quinte Conservation. Firewood can be measured by a sample scale of truckloads. Quinte Conservation retains the right to monitor and dictate any conditions on wood scaling that it feels are necessary to protect its interests.

Wood hauled from QC Forest is monitored through a bill of lading system. This system is a critical requirement for mills producing FSC® certified forest products. These mills require Chain of Custody certification before they can sell forest products that are labeled as FSC® certified. Tracking the movement of certified wood from an FSC® certified forest to the mill is one step in this process. The requirements for Chain of Custody certification and wood tracking are outlined in the EOMF Forest Certification Policies and Procedures Manual.

6.6 HARVEST OPERATIONS

All harvest operations are carried out according to a signed contract between the Purchaser and Quinte Conservation. The contract describes in detail the wood volumes and prices, wood measurement, operating conditions and legal and safety requirements. Logging contractors must carry appropriate insurance and Workplace Safety and Insurance Board (WSIB) coverage to protect Quinte Conservation from liability.

All logging operations are monitored regularly by the Forest Manager to ensure compliance with the contract, forest operations prescription and operating standards.

6.7 FOREST HARVESTING ACCESS

MUNICIPAL LOAD RESTRICTIONS

Reduced load restrictions (5 tonnes per axle) are in force every spring on those roads that are posted with the appropriate signs. The spring load restrictions usually begin in early March and last 6 to 8 weeks. Restrictions are removed when the likelihood of road damage has diminished.

HARVEST ROADS

Access into a property is usually gained from existing forest access roads or old roads and farm laneways. Periodically a new section of road may need to be constructed by harvesting contractors. All new roads and landings must adhere to Table 22 (Areas of Concern) and be approved by the Forest Manager before operations commence. If a harvest area is close to a municipal road, wood may be piled at roadside (with permission of the Road Superintendent).

The construction of new access onto a property from a township road requires the permission of the Township Road Superintendent. To avoid creating new permanent access roads, which can lead to misuse of the property (e.g. garbage dumping), these roads are generally designed to be temporary. After use the entrance to the road is usually decommissioned by culvert removal and/ or physical blocking with berms, ditches or trees or other materials.

Existing access roads and water crossings must be maintained to the same standards as encountered at the beginning of harvest operations. Logging contractors must repair to original condition damage to roads, trails, fences, gates, culverts, bridges, utilities or other improvements damaged beyond ordinary wear and tear.

Any new water crossings which are required will be constructed consistent with local best management practices and with appropriate approvals and permits.

SKIDDER/ FORWARDER TRAILS

Logging contractors must construct access trails for logging equipment to extract harvested trees. In plantations, access trails are generally created by removing marked rows of trees, usually ranging from every third to every fifth row. In natural stands, access trails are located in more open areas of the forest, preferably adjacent to trees which are marked for harvest.

The stumpage sale contract between Quinte Conservation and the logging contractor provides specifications on:

- maximum area of access trail coverage,
- acceptable levels of trail rutting and
- acceptable levels of damage to residual trees.

Low, wet sites are prone to excess rutting and compaction in the frost-free season. These sites cannot be harvested in compliance with the contract standards until solid frost has developed in the ground.

6.8 FOREST HARVESTING: NORMAL HARVEST OPERATING SEASON

By providing opportunities for sustainable harvest of timber, Quinte Conservation is contributing to the overall improvement in forest practices in the watershed and the provision of local employment opportunities. Although it is important to provide these opportunities for as great a period of time as possible, Quinte Conservation has defined the normal harvest operating season to be approximately nine months in duration. Operations usually do not occur within the period of spring break-up (mid-April to mid-July) for a number of reasons:

- The bark of trees is particularly susceptible to damage and peeling, resulting in increased wounding and long-term decay,
- Heavier soils are saturated with water and prone to rutting and erosion,
- This is the prime breeding season for many bird species, and
- Municipalities place load restrictions on roads limiting the hauling of wood

6.9 MAPLE TAPPING

Maple tapping is a historic forest use that traces its history to indigenous people. It was a common practice on early pioneer farms, although over time maple syrup production significantly decreased. The Conservation Authority Founding Reports (Ontario Government, 1950 and 1957) describe a decline in maple syrup production from farms in Hastings, Lennox & Addington and Frontenac Counties of 996,310 gallons in 1860 to 42,984 gallons in 1940. Changes in farm practices and the availability of other sugar sources are the main reasons for this decline.

Commercial maple syrup remains as an important specialized agriculture/ forest product in eastern Ontario, and several producers lease taps on Community Forests including Lanark County, Larose Forest and the United Counties of Stormont, Dundas and Glengarry. Forest certification standards are compatible with the activity.

In 2023 a report indicated the potential for exploring this opportunity on two QC Forest compartments within the commercial designated MF 123 Downey Rapids Block: 17a and 40. This will be evaluated by Quinte Conservation for possible implementation.

7.0 MONITORING AND ASSESSMENT

7.1 PROPERTY

Ongoing property inspections are required to ensure that the properties, roads and sites of cultural and recreational significance are maintained in good condition, to address uses of the properties that are inconsistent with the policies of the Conservation Authority, and to cooperate with neighbouring landowners on issues of joint interest. For formal inspections, the Forest Manager will complete a Community Forest Inspection form. Whenever possible, the inspections will be carried out in conjunction with ongoing forestry activities to increase efficiencies.

Inspections will be carried out according to the level of intensity of use and/ or misuse of a particular property. Quinte Conservation will strive to respond promptly to complaints regarding improper uses of the Forest. Inspection frequency will be increased for properties where a violation of land use policy has occurred and where a risk of reoccurrence is considered as possible.

7.2 FORESTS

EFFECTIVENESS MONITORING

The prescriptions for harvesting and renewing the QC Forest are derived from the OMNR's Silviculture Guides (see bibliography). For each harvest area, a site-specific harvest plan is prepared by a member of the OPFA consistent with the silviculture guides. The effectiveness of the guides is assessed through long-term monitoring by Forest Managers and through forest science programs. For example, the OMNR maintains an extensive network of growth and yield plots throughout Ontario, including many plots in eastern Ontario. Results of silvicultural effectiveness monitoring are incorporated in revisions to the Provincial Silviculture guides.

HARVEST MONITORING

Harvest and thinning activities including access are regularly monitored by the Forest Manager to ensure compliance with the standards of this Management Plan, the EOMF Forest Certification Policy and Procedures Manual (2024), the forest operations prescription and the stumpage sale contracts. The detailed procedures for monitoring and implementing corrective actions are provided in the EOMF Manual.

Monitoring results are documented on the Pre-harvest Meeting Forest Operations Inspection Forms and kept on file. This form provides a comprehensive check-off system which are assessed in harvest inspections. The main categories are:

- Access
- Areas of concern
- Harvest standards
- Utilization
- Safety
- Emergency preparedness

POST-HARVEST ASSESSMENTS

After a harvest operation is finished, a post-harvest assessment is completed by the Forest Manager to:

1) Confirm that the objectives of the forest operations prescription have been achieved.
2) Assess the final species composition and stocking of the forest. Updates to the Forest Resource Inventory will be made to document substantial changes to the forest.
3) Assess the need for renewal activities (eg site preparation, tree planting, tending) after uniform shelterwood and clearcut operations.
4) Estimate the time of next harvest. This information is used to update the schedule of harvest operations contained in the Operating Plan. This ensures that a balanced level of timber volume and revenue can be maintained.

REGENERATION ASSESSMENTS

Two levels of regeneration assessment are carried out. Extensive assessments are carried out for commercial thinning operations where regeneration is not a primary objective, and for stands where high levels of desirable advanced regeneration exist. Extensive surveys are a visual assessment based on a walk-through of the area. Intensive regeneration surveys are carried out to verify the success of old field afforestation projects and regeneration of challenging species after shelterwood harvesting, primarily white pine and oak. The Forest Manager monitors the activities of site preparation, tree planting and tending to ensure that the desired standards are achieved. Commencing in 2028, a schedule of regeneration assessments will be included in the Ten-Year Operating Plan based on the stands harvested in the previous Operating Plan.

FOREST HEALTH

OMNR's Forest Health Technician monitors local forest health conditions and provide updates to forest managers through information meetings. Forest managers can report observations of forest health conditions to the technician for further investigation. The Canadian Forest Service maintains a laboratory where the identification of collected specimens can be confirmed.

7.3 NATURAL HERITAGE VALUES

EFFECTIVENESS MONITORING

The management prescriptions for conserving natural heritage values are derived from OMNR's Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (2010). Direction in this guide is based on the best scientific information and expert advice available at the time of writing. OMNR maintains a program of scientific studies to assess the effectiveness of Guides. These studies are used to assist in the review and revision of Guides.

Through the involvement of community partners, supplementary programs for monitoring natural heritage values on the QC Forest may be developed.

FISH AND WILDLIFE HABITAT AND POPULATIONS

OMNR periodically assesses the status of wildlife habitat and populations. Examples of these assessments include lake and stream surveys, wetland evaluations, and aerial mapping of deer wintering areas. Updates to this information are available to Quinte Conservation through Land Information Ontario (LIO). The EOMF Certification Coordinator provides Forest Managers with updates on the status of Species at Risk and habitat regulations.

7.4 CERTIFICATION AUDITS

As a participant in the EOMF Forest Certification Program, Quinte Conservation participates in the certification and five-year recertification audits to ensure that all activities are in compliance with FSC and SFI standards. The EOMF Certification Coordinator also carries out internal audits of program participants to ensure compliance with EOMF policies, procedures and agreements.

Quinte CONSERVATION

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Watershed Municipalities

City of Belleville
City of Quinte West
County of Prince Edward
Loyalist Township
Madoc Township
Municipality of Centre Hastings
Municipality of Marmora and Lake
Municipality of Tweed
Town of Deseronto
Town of Greater Napanee
Township of Addington Highlands
Township of Central Frontenac
Township of North Frontenac
Township of South Frontenac
Township of Stirling-Rawdon
Township of Stone Mills
Township of Tudor and Cashel
Township of Tyendinaga